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EARLY MILD INFESTATION WITH THE PARASITE TRICHINELLA SPIRALIS

REPORT OF TEN CASES

JEROME E. ANDES, PH.D., M.D.
ROBERT A. GREENE, PH.D.
AND
EDWARD L. BREAZEALE, B.S.A.
TUCSON, ARIZ.

It is only within the last few years that the prevalence and significance of human infestation by the nematode Trichinella spiralis has been brought to light. A few decades ago, trichinella infestations were regarded as rare occurrences, chiefly because in few individuals did sufficient symptoms develop to allow a diagnosis. Recent studies of autopsy material, however, have definitely proved that this disease is very common. Practically all of the accurate cadaveric studies indicate that at least 10 per cent of the population of the United States have some encysted trichinella parasites in their muscles before death. The recent studies of Evans [1] give the incidence as between 5 and 50 per cent in the various cities of the United States, with an average figure of 37 per cent.

It is obvious that there is a marked lack of agreement between the data obtained from necropsy studies and the number of clinical cases reported. The reason for the discrepancy is probably to be found in the high percentage of undiagnosed and symptom-free cases. It is only plausible that in most cases the symptoms are so mild or so lacking in characteristic manifestations that Trichinella spiralis infestation is not even considered.

After ingestion of the meat infested with the trichinella (usually pork) the encysted parasites are freed from their capsules by the process of digestion. After growing to maturity and mating, the female burrows into the intestinal wall and starts to produce young in large numbers. Approximately a week passes before the period of multiplication begins. The symptoms during this first period are those of an intestinal irritation: nausea, vomiting, low grade fever, diarrhea and abdominal discomfort. The degree of severity of the symptoms must depend largely on the number of worms present, and it seems only too plausible that one pair of worms would produce little or no discomfort.

The second stage of the disease (period of dissemination, or larval migration) begins from the eighth to the tenth day and may last several weeks. During this time large numbers of larvae enter the blood and pass to all parts of the body. Apparently only those that reach the skeletal muscles survive, and their encystment and digesting away of the surrounding muscle tissue are the cause of the characteristic muscle pain and tenderness that develop. The liberation of the muscle protein probably produces the accompanying fever, edema of the face, prostration, cachexia and anemia appearing at this time. The third stage is that of muscle encystment and recovery.

As stated previously, it is probable that a very small number of parasites in the intestinal tract would produce few if any symptoms. Even in the muscle encystment process, a fairly large number of larvae would need to invade the muscles to cause a noticeable soreness; consequently it would seem that it might be difficult or even impossible to diagnose very mild cases of trichinella infestation. Furthermore, it also seems plausible that the administering of an anthelmintic before the period of multiplication begins might stop the entire process at this point.

During the previous school year we had a number of cases (all within about ten days) which we feel were produced by infestation with the trichinella parasite. All were very mild in character except one, and this case was only moderately severe.

REPORT OF CASES

CASE 1.—J. L. O., a white youth aged 19, came to the clinic on Jan. 18, 1939, with a complaint of abdominal pain and discomfort. The symptoms had been present for about forty-eight hours. The abdominal discomfort was described as a dull continuous ache. There had been no vomiting or diarrhea, jaundice, belching or abnormal stools. He had been eating regularly up to the day of admission, and his bowels had been entirely normal. He had never had a qualitative dyspepsia and had never had any serious gastrointestinal disturbances during his life. He also stated that he had noticed a low grade fever and had had several chills since the onset. All the rest of the history was entirely irrelevant except that he had eaten some fresh pork about twenty-four hours before the onset of the symptoms.

The patient was well developed and well nourished and appeared ill. There were no gross abnormalities. His face was flushed and there was a definite puffiness about the eyes. A small amount of tenderness over the frontal sinuses with some postnasal dripping was present. The chest was entirely normal, the blood pressure being 120 systolic, 78 diastolic. The abdomen showed a palpable descending colon but no tenderness or other abnormal signs. The genitalia, skin and extremities were entirely normal. There was no muscle tenderness. The temperature was 98.4 F. and the pulse rate 74. He was admitted to the hospital with a diagnosis of chronic sinusitis, ileocolitis and possibly trichinosis.

The urine was entirely normal. The white count revealed 7,000 white cells, and the differential count showed 14 per cent eosinophils, 64 per cent neutrophils, 20 per cent lymphocytes and 2 per cent monocytes. A cutaneous sensitivity test with the trichina antigen was strongly positive. He was given 3 Gm. of tetrachlorethylene followed two hours later by 30 Gm. of magnesium sulfate.

From the Department of Health, University of Arizona, and the Arizona State Laboratory.

1. Evans, C. H., Jr.: J. Infect. Dis. 63: 337 (Nov.-Dec.) 1938.

The next day the count showed 7,000 cells with 16 per cent eosinophils. By evening he was greatly improved, and his temperature and pulse were entirely normal. The highest temperature noted while in the ward was 99.4 F. There was no muscle tenderness at any time while he was in the hospital. He was discharged with a diagnosis of early trichinosis. Permission for a biopsy was refused.

On February 19 (thirty-four days later) he came in for a check-up. He had not been ill since discharge. The examination was negative. A count revealed 7,400 white cells, with no eosinophils nor basophils, 85 per cent neutrophils, 13 per cent lymphocytes and 2 per cent monocytes. A second check-up on May 25 was again entirely negative. The count was 6,600 white cells with 64 per cent neutrophils, 32 per cent lymphocytes, 4 per cent monocytes and no eosinophils or basophils.

Case 2.—Miss B. H. U., a white girl about 17 years old, was admitted to the ward on Jan. 21, 1939, with a complaint of pain and discomfort in her abdomen. About midnight before the day of admission she awoke very nauseated and vomited several times. The nausea continued all night and was accompanied by several loose stools. In the morning she had a temperature of 100 F. The rest of her history was entirely normal or irrelevant. The food history was irrelevant. At the time of admission she was still nauseated but had no diarrhea, vomiting or other gastrointestinal complaints. She had not eaten all day.

The patient was well developed and well nourished with no gross abnormalities. Her temperature was 98.8 F. and her pulse rate 80. Her face was flushed and the skin around the eyes somewhat edematous. The throat, lungs and heart were entirely normal. Examination of the abdomen revealed some diffuse discomfort on manipulation, the tenderness being somewhat more marked in the right lower quadrant. There was no rigidity, abnormal masses or enlarged organs. Examination of the extremities revealed no muscle tenderness. The provisional diagnosis was acute gastro-enteritis or trichinosis.

Blood Counts in Case 3

	Total	Eosinophils	Neutrophils	Basophils	Lymphocytes	Monocytes
8:15 a. m.	6,600	4	60	0	27	10
1:15 p. m.	6,000	2	63	0	30	4
5:00 p. m.	6,200	12	61	1	19	7

The urine was normal except for a few epithelial cells. The total white count was 12,000 with 16 per cent eosinophils, 68 per cent neutrophils, 14 per cent lymphocytes and 2 per cent monocytes. The cutaneous test with trichina antigen was strongly positive. She was given 3 Gm. of tetrachlorethylene followed by magnesium sulfate two hours later.

During the next twenty-four hours her temperature varied from 99 and 101 F. By the end of the second day her temperature was normal and all the nausea and intestinal discomfort and tenderness had disappeared. She was discharged with a diagnosis of trichinosis with acute gastro-enteritis.

She returned January 30 (eight days from onset) for a check-up. She had no complaints and no abdominal or muscle tenderness. The white count was 6,000 with 3 per cent eosinophils, 57 per cent neutrophils, 36 per cent lymphocytes and 4 per cent monocytes.

Case 3.—E. B., a white man about 21 years old, came into the clinic on Jan. 23, 1939, complaining of headache, fever, backache, pains in all his muscles, marked malaise and swollen glands in the back of the neck. All the symptoms except the muscle tenderness had been present for a week. He had eaten fresh pork one or two days before the onset. The muscle pain and tenderness had developed within the last two days. He had no complaints relative to the cardiovascular, respiratory, gastrointestinal or genito-urinary tract. No other relevant facts were obtained.

He stated that about a year before he had had an attack of a similar nature (which he called "glandular fever"). He was in the hospital for a week and was discharged with a diagnosis of trichinosis. No biopsy was made.

The patient was well nourished and well developed and acutely ill. His temperature was 101 F. and his pulse rate 95. His face was flushed and a definite edema was present in the soft tissues around the eyes. The conjunctiva was injected. The breath was foul and the tongue heavily coated. The mouth and throat, chest and abdomen were entirely normal. The muscles of the extremities were slightly tender. There was considerable posterior cervical adenopathy. He was admitted to the ward with a diagnosis of acute infection of the upper respiratory tract or typhoid.

The white count was 4,800 with 18 per cent eosinophils, 63 per cent neutrophils, 15 per cent lymphocytes and 4 per cent monocytes. The urine revealed only a trace of albumin. Agglutination tests for typhoid, paratyphoid, undulant fever and tularemia were all negative. The cutaneous sensitivity test with trichina antigen was very strongly positive. He was given 3 cc. of tetrachlorethylene followed by magnesium sulfate two hours later.

He was quite ill for the next forty-eight hours, his temperature going as high as 104 F. By the end of the third day, however, the headache and muscle pains had definitely improved. A white count showed 9,000 cells with 29 per cent eosinophils and 55 per cent neutrophils. The next day the patient had no complaints, although his face was still swollen and his temperature from 99 to 100.5 F. The white count was still 9,000, but the eosinophils had increased to 36 per cent. He left the ward without permission, as he wanted to go home and rest.

On February 1, nine days after the first admission, he returned to the clinic for a check-up. He still had some muscle soreness and tenderness and complained of moderate malaise and slight undulating fever. He had been in bed throughout his absence. The white count was 6,100 with 36 per cent eosinophils, 40 per cent neutrophils, 24 per cent lymphocytes and 2 per cent monocytes.

On February 8 he seemed to be almost symptom free. Owing to a disagreement with our blood counts and the data of another laboratory, three counts were made the same day.

The last check-up was on February 25, about five and one half weeks after the onset. At that time he was symptom free. The white count was 6,500 with no eosinophils, 60 per cent neutrophils, 36 per cent lymphocytes, 1 per cent basophils and 4 per cent monocytes. The count was taken in the morning.

Case 4.—J. A. C., a white man aged 22, came into the clinic on Jan. 24, 1939, complaining of severe headache, marked malaise, fever, abdominal discomfort and some aching in the back and legs. He was perfectly well until the previous night. The illness began with abdominal discomfort followed by the other symptoms. He believed he had a slight fever, but there were no chills. To his knowledge he had had no previous attacks. The food history was entirely irrelevant. The respiratory, cardiovascular, gastrointestinal and genito-urinary systems were essentially normal except for mild chronic constipation. The appendix had been removed several years previously.

The patient was well developed and well nourished and he appeared ill. His temperature was 100.5 F. and the pulse rate 88. The skin was warm and dry and the face flushed. There was some suggestion of edema around the eyes. A small amount of tenderness was found over the frontal sinuses, but the head and neck were otherwise normal. The chest was entirely normal. No pathologic abdominal condition was found except a tender palpable colon filled with feces. The muscles of the back and extremities exhibited no tenderness. He was admitted to the ward with a tentative diagnosis of acute infection of the upper respiratory tract and fecal impaction.

An enema gave excellent results. The next morning he was greatly improved. The urine was normal but the blood count revealed 5,000 white cells with 8 per cent eosinophils, 68 per cent neutrophils, 24 per cent lymphocytes and 2 per cent monocytes. He preferred not to take a vermifuge, and since he was symptom free he left the ward late in the afternoon of the second day. Material was not available for a cutaneous test. He left school a few days later and no follow-up was possible. He even refused to return for another blood count. In view of the blood count and the similarity of the symptoms to those of the other patients in the ward at the same time, it was felt that he had suffered a mild attack of trichinosis.

CASE 5.—H. T. S., a white man aged 23, came to the clinic on Jan. 26, 1939, chiefly because of headache, fever and marked malaise. The history was that he ate a pork sandwich about three days previously. About twenty-four hours later he became ill with headache, backache, marked malaise, a low grade fever and marked abdominal discomfort. The previous night he was markedly nauseated but did not vomit. There was no diarrhea at any time. During the previous twenty-four hours the headache and backache had somewhat improved but the fever and malaise had increased. The rest of the history was entirely irrelevant except for a slight cough and tracheal irritation for the last twenty-four hours. There had been no expectoration, dyspnea or other chest complaints. He had never had any illness similar to the present one.

The patient was well developed and well nourished and he appeared ill. His skin was warm and dry and his face flushed, with definite subcutaneous edema about the eyes. The temperature was 102.2 F., the pulse rate 120 and the respiration quite rapid. Careful examination of the rest of the head, throat, chest, abdomen and genitalia was entirely negative. There was no muscle tenderness and the reflexes were normal. He was admitted to the ward with a tentative diagnosis of trichinosis with possible early acute infection of the upper respiratory tract.

A blood count made after admission revealed 4,550 white cells, with 2 per cent eosinophils, 68 per cent neutrophils, 26 per cent lymphocytes and 4 per cent monocytes. The urine revealed only a slight trace of albumin.

The night after admission the patient became very nauseated and had a severe chill followed by a temperature of 103 F. He slept most of the rest of the night and the next morning appeared much improved. There were no respiratory complaints and the other symptoms were greatly alleviated. A new count revealed 8,450 white cells with a differential count of 26 per cent eosinophils, 56 per cent neutrophils, 16 per cent lymphocytes and 6 per cent monocytes. No material was available for a cutaneous sensitivity test for trichinosis but he was given 2.5 cc. of tetrachlorethylene followed by magnesium sulfate.

The next day his face was much less flushed and his only complaint was a slight headache. His temperature was still 101 F. with a pulse rate in proportion. By the fifth day his temperature was entirely normal and he was symptom free. He was discharged, the final diagnosis being trichinosis.

On Feb. 7, eight days after discharge, he returned for a check-up. He was entirely well. The white count was 5,850. The differential count revealed no eosinophils or basophils, 60 per cent neutrophils, 32 per cent lymphocytes and 8 per cent monocytes.

CASE 6.—On Jan. 30, 1939, F. D. S., a white man aged about 20, came in complaining only of marked malaise. He had been perfectly well until the previous day, when he began to feel "rotten all over." A slight headache also developed, and during the night he had several chills and a continuous fever. He also had a slight irritation of the throat and some burning of the eyes. At the time of admission the only remaining complaint was the marked malaise and a slight headache. There were no other eye, nose, throat or respiratory complaints, and the cardiovascular, genito-urinary and gastrointestinal histories were entirely noncontributory. He stated that he ate some type of bologna meat the day before the onset but that there had been no other meat in his diet since he ate beef a week previously. He had had no previous attacks.

The patient was well developed and well nourished and appeared ill. His skin was hot and dry and his face red, with considerable edema around the eyes. The conjunctiva was slightly injected and the pharynx slightly reddened. Moderate cervical adenopathy was present. The rest of the examination was entirely negative. There was no muscle tenderness. His temperature was 102 F. and his pulse rate 110. The blood pressure was 125 systolic, 84 diastolic. The provisional diagnosis was trichinosis.

The urine analysis was essentially negative. The white count was 12,500 with 8 per cent eosinophils. The cutaneous sensitivity test with trichina antigen was positive. Three cc. of tetrachlorethylene was given by mouth followed by magnesium sulfate. The next day his temperature had dropped to 99 F. The patient felt so much improved that he left the ward without permission before a second count could be taken.

On February 7 (nine days after the onset) he returned for a check-up. He had no complaints or relevant physical evidence. A count revealed 5,000 white cells with 4 per cent eosinophils, 66 per cent neutrophils, 24 per cent lymphocytes and 6 per cent monocytes.

CASE 7.—On Jan. 30, 1939, Miss R. W., aged about 20, white, came to the clinic complaining chiefly of nausea and occasional headaches for the last two days, together with a marked malaise. She ate pork sausage and pork chops the day before the onset. (The chops were well done.) There were no symptoms relative to the head, neck, cardiovascular or respiratory system. There were absolutely no other abdominal complaints. The bowels and stools had been entirely normal. Her appetite had been poor since the onset of the present illness. The patient gave a history of chronic sinusitis and hay fever, but there had been no recent attacks. She had been working very hard in school for the last four weeks.

The patient was well developed and well nourished and she appeared definitely ill. Her temperature was only 99 F., but her pulse rate was 96. The skin was warm and dry with flushing of the face and a suggestion of edema about the eyes. The rest of the head, the chest and the abdomen were entirely normal. The blood pressure was 116 systolic, 80 diastolic. She was admitted to the ward with a tentative diagnosis of overwork and exhaustion and possible trichinosis.

A white count revealed 10,500 white cells with 2 per cent eosinophils, 72 per cent neutrophils, 24 per cent lymphocytes and no monocytes. The urine was normal.

That night she had a large bowel movement which appeared to give symptomatic relief. The temperature remained around 100 F., however, with a rapid pulse. A new count revealed 12,250 white cells with 11 per cent eosinophils, 78 per cent neutrophils, 9 per cent lymphocytes and 2 per cent monocytes. She was given 2.5 cc. of tetrachlorethylene followed by magnesium sulfate.

The next day, February 1, she was greatly improved symptomatically with a normal temperature. A new blood count revealed only 5,950 white cells with 7 per cent eosinophils, 77 per cent neutrophils, 13 per cent lymphocytes and 3 per cent monocytes. She was discharged that evening. No material was available for a cutaneous sensitivity test. The final diagnosis was trichinosis.

On February 8, seven days after discharge, she returned for a check-up. She was symptom free and the white count was 5,000. (The slides for a differential count were accidentally destroyed.)

CASE 8.—On Jan. 31, 1939, D. S. K., a white man aged about 21, came in complaining chiefly of nausea and marked malaise. He was perfectly well the previous day, and in the evening he had eaten rather copiously of a pork roast (his work consisted of kitchen duties), some parts of which were definitely underdone. The symptoms all appeared the next morning. In addition to nausea and malaise, he had a slight frontal headache and some vague abdominal discomfort. He had one loose stool shortly after the appearance of the symptoms but no vomiting at any time. He also had had a slight amount of aching of the back, legs and arms since the onset and also a low grade fever but no chills. There were no other complaints relative to the head, cardiorespiratory, gastrointestinal or genito-urinary tract. The past history was essentially noncontributory.

The patient was well developed and well nourished and looked quite ill. His temperature was 99.8 F. and his pulse rate 100. There were no gross defects or deformities. The skin was warm and dry. The face was flushed, with slight edema of the subcutaneous tissues about the eyes and nose. The head and throat were otherwise normal. There were no abnormal features in the chest or abdomen (not even increased tenderness). A small amount of tenderness of the muscles of the calf, biceps, shoulder and lumbar area was present. He was admitted to the ward with a tentative diagnosis of trichinosis or acute gastro-enteritis.

A blood count revealed 11,500 white cells, with 8 per cent eosinophils, 74 per cent neutrophils, 14 per cent lymphocytes and 4 per cent monocytes. The urine was normal. He was given 3 cc. of tetrachlorethylene followed by magnesium sulfate.

During the night his temperature went to 101.2 F. and his discomfort increased. In the morning his temperature was normal and he looked greatly improved. He had no complaints. A cutaneous sensitivity test with trichina antigen was strongly positive. A new blood count revealed 12,000 white cells with 14 per cent eosinophils. He was symptom free the next day and was discharged. He failed to return for a check-up but remained perfectly well.

CASE 9.—On Feb. 9, 1939, Miss H. B., aged 19, white, consulted us at the clinic because one of our previous patients had come from her sorority. Her only complaints were malaise and some abdominal discomfort for the last forty-eight hours. She had eaten fresh pork forty-eight hours before the onset of the symptoms. The rest of her past history was entirely irrelevant.

The patient was well developed and well nourished and was not acutely ill. The pulse and temperature were normal. There were no gross abnormalities. The face was slightly flushed but there were absolutely no other abnormal features. The chest and abdomen were entirely normal and there was no muscle tenderness.

A count revealed 5,600 white blood cells with 5 per cent eosinophils, 78 per cent neutrophils, 15 per cent lymphocytes and 2 per cent monocytes. She refused to stay in the hospital and left before the count was completed.

She returned the next day and received a cutaneous sensitivity test to trichina antigen. The test was definitely positive. A new count revealed 6,000 white cells with 14 per cent eosinophils, 68 per cent neutrophils, 14 per cent lymphocytes and 2 per cent monocytes. She stated that her symptoms had not changed. She was given 2.5 cc. of tetrachlorethylene by mouth followed by magnesium sulfate. She was in the ward only about six hours. The final diagnosis was trichinosis.

On February 8, six days after her discharge, she returned for a check-up. The white blood count was 7,200. The differential count was reported as unsatisfactory but there was no eosinophilia.

CASE 10.—On Feb. 4, 1939, L. A., a white man aged about 20, came to the clinic complaining chiefly of abdominal pain and discomfort. His illness began about six days previously and first consisted of marked malaise, anorexia and a "heavy feeling." Two or three days after the onset he began to have a mild headache. There were no chills, but he felt that he had a low grade fever at times. He had been trying to play tennis at intervals and his muscles were all sore (from this?). For a week he had had considerable difficulty in reading accompanied by some dull aching around the eyes. He had eaten pork (pork chops) twice in one day about twenty-four to thirty-six hours before the onset of the present illness.

The rest of the history was irrelevant. He had had no constipation, diarrhea, vomiting, abnormal stools, jaundice or other abdominal complaints. (His abdominal complaint was not actual pain but diffuse discomfort.) He had no chronic diseases. There was no history of sinusitis or error of refraction.

The patient was well developed and nourished and there were no gross deformities. His temperature was normal but his pulse rate was 96. The face was flushed and there was a definite circumorbital edema. No tenderness or other pathologic feature was noticed in the sinuses, and the rest of the head was entirely normal. The chest was normal. The abdomen showed only a diffuse tenderness, with no enlarged organs, masses or rigidity. There was definite tenderness of the muscles of the extremities and back. He was admitted to the ward with a tentative diagnosis of trichinosis.

A blood count revealed 10,000 white cells, with 8 per cent eosinophils, 60 per cent neutrophils, 28 per cent lymphocytes, 2 per cent basophils and 2 per cent monocytes. The urine was normal. A cutaneous sensitivity test with trichina antigen was positive. He was given 3 cc. of tetrachlorethylene followed by magnesium sulfate. The next morning his temperature was still normal. The abdominal discomfort was gone, likewise the tenderness. The aching of the muscles was unchanged. He was allowed to go home and stay in bed.

February 9 (four days later) he returned for a check-up. He had no complaints and most of the muscle tenderness had disappeared. A count revealed 6,400 white cells with 3 per cent eosinophils, 56 per cent neutrophils, 33 per cent lymphocytes and 8 per cent monocytes. On February 25 he came in with malaise (apparently from an acute infection of the upper respiratory tract). His count revealed 6,400 white cells with 3 per cent eosinophils and 70 per cent neutrophils. The final diagnosis of his previous condition was trichinosis.

COMMENT

In studying the cases just presented one easily notes the similarity of the symptoms in all cases. In nearly every instance the onset was chiefly characterized by a marked malaise with some abdominal discomfort. Nausea was usually present, but diarrhea and vomiting were usually absent. Some degree of fever was present in nearly every case, and chills in some. Only in cases 3 and 10, in which (especially the former) the stage of larval migration was being entered, was there any complaint of muscle pain or tenderness. In only one case was there no history of eating pork from one to three days before the onset, and in several cases the pork was not well cooked.

Examination of the patients revealed several noteworthy points: First, the patients all looked and acted quite ill; second, a definite flushing of the face with some degree of edema about the upper part of the face was present; third, all but one complained of generalized discomfort when the abdomen was palpated. The temperature was usually not high. In the two with more advanced infestation (patients 3 and 10, especially the former), muscle tenderness was present.

In all cases in which tests were made there was a positive reaction to the intracutaneous injection of trichinella antigen.[2] A control test of physiologic solution of sodium chloride was used with every injection. This test was negative or nearly so on the first day of the onset but was definitely positive in all cases by the third day. In case 3 (showing signs of muscle invasion) there was an area of edema and erythema about 4 inches in diameter.

The total white counts were normal or but slightly increased. Eosinophilia was usually not present until the second day after the onset. In the cases treated within the first few days of the illness, all symptoms disappeared within two to four days and the counts were normal within ten days; furthermore, no muscle tenderness developed. Biopsies were requested but refused in every instance. Blood serum from patient 3 was sent to Washington for a precipitation test, but unfortunately the container was broken in transit. Fecal studies revealed no evidence of parasites.

Owing to the fact that no biopsies were made, we cannot definitely say that the cases reported were trichinosis; however, the epidemic-like grouping of the cases, the positive cutaneous reactions, the eosinophilia, the history of eating pork (partially cooked in some instances) and the absence of any other similar condition makes it seem highly probable that trichinella infestation was the cause of the symptoms observed. The symptoms in every case were similar, and all patients appeared within an interval of about ten days, many being in the wards at the same time.

In order to be more certain about the value of the positive skin test, injections were made in a large

2. This was obtained from the National Institute of Health, U. S. Public Health Service, Washington, D. C.

number of cases of sinusitis, gastro-enteritis and other diseases during the next three months. All reactions were entirely negative. Furthermore, no cases of eosinophilia were observed during this time.

It is our belief that the sudden, almost simultaneous, appearance of the entire group of cases was due to a shipment into Tucson of "measly" pork. As soon as the dining halls were advised of the presence of the infestation on the university campus, no more pork was served for over a month; also no more cases developed.

We cannot say that the administration of tetrachlorethylene stopped the progress of the disease. It is possible that the cases so treated were so mild that recovery would have occurred spontaneously with no further symptoms. However, the appearance of muscle pain and tenderness in the two cases in which we were consulted about a week after the onset, and the long drawn out course of case 3, make us believe that the drug actually stopped what may have turned out to be severe infections, preventing the appearance of the second and third stages of the disease.

One further point previously unmentioned is the peculiar tendency for the eosinophil count to increase during the day (in the case of marked muscular involvement). Counts were made on several successive days to verify this. It would appear that muscular action during the day must liberate the foreign protein from the muscles and stimulate the production of the eosinophils. If this change exists in every case, differential counts had best be made at the close of the day.

SUMMARY

1. Of ten patients believed to have been infested with Trichinella spiralis, all but one gave a history of eating pork from one to three days before the onset.

2. The condition of eight of these patients was diagnosed within the first three days of the onset. The most common symptoms were malaise, abdominal discomfort, fever, headache, and edema around the eyes. All showed a definite eosinophilia and all tested gave a positive skin reaction with trichinella antigen. Administration of tetrachlorethylene was followed by complete and immediate recovery.

3. The two patients consulting us six and seven days after the onset contracted muscle pain and tenderness; patient 3 showed a fairly long drawn out convalescence.

4. The eosinophil content of the blood was shown to rise continually during the day, being highest in the evening.

Bence Jones Protein.—Bence Jones protein is chemically and immunologically distinct from the other serum proteins. From the work of Meyler it would seem to be a normal constituent of bone marrow, lymphocytes and other white blood cells. A source of Bence Jones protein exists, therefore, under normal conditions and an increase may be expected when large numbers of white cells are destroyed as in empyema or leukemia, or when bone marrow gets into the circulation, as in bone metastases. Nevertheless, even under these conditions, Bence Jones proteinuria occurs very infrequently, which may mean that the body is capable of utilizing or destroying relatively large amounts of this protein. It is only when the amounts produced are excessive and not completely destroyed that a part is excreted in the urine. The excretion of Bence Jones protein is known to have exceeded 50 Gm. per day in several instances. When the quantity excreted is large and of long duration, anatomical injury to the kidneys may be assumed.—Bodansky, Meyer, and Bodansky, Oscar: Biochemistry of Disease, New York, Macmillan Company, 1940.

VASCULAR DISORDERS OF PERIPHERAL NERVES

J. L. FETTERMAN, M.D.
AND
D. K. SPITLER, M.D.
CLEVELAND

Medical literature has considered instances of peripheral nerve involvement occurring in the course of specific diseases. Yet the concept of neuropathy due to a defective blood supply has not been sufficiently stressed.[1] Recent experience in the wards of Lakeside Hospital with ischemic neuropathy has prompted us to assemble clinical examples which have occurred in a variety of diseases and to group them together under one heading.

ANATOMY

The standard textbooks of anatomy and histology give but brief mention to the vascular supply of peripheral nerves. Ramage [2] observed that, in the nerve trunks, cords and peripheral nerves of the upper extremity, circulation is maintained through several nutrient arteries. His work substantiates the theory laid down by Quénu and Lejars [3] that the blood supply of a peripheral nerve does not come from a single arterial branch but always comes from multiple sources.

Buitink [4] studied the blood supply of the peripheral nerves in the lower extremity. He determined that it arises from neighborhood vessels, branches of which enter the nerve at various angles and then subdivide into ascending and descending branches. Twigs from these vessels frequently anastomose, providing a network which can be seen in the gross view. Chaumet [5] has confirmed these observations by roentgenograms of injected specimens. In view of this anastomosis and the free communication of the arterial twigs within the nerve trunk, a nerve lesion of clinical degree could occur only if many twigs in one area were simultaneously affected or if a main branch was occluded. Under the circumstances of a severe diminution in the blood supply there would be a consequent degeneration of the nerve trunk at this level and in that portion of the nerve distal to the site of ischemia. An excellent description of the degenerative changes which follow damage to a peripheral nerve is contained in Hassin's book on neuropathology.[6]

Among the clinical conditions in which damage to peripheral nerves occurs because of vascular disease, the following may be mentioned:

1. Trauma.
2. Embolism.
3. Arteriosclerosis and diabetes mellitus.
4. Thrombo-angiitis obliterans (Buerger's disease).
5. Periarteritis nodosa.
6. Syphilis.
7. Polycythemia vera and other miscellaneous causes.

Dr. J. T. Roberts collaborated, particularly in the matter of several injection and dissection experiments.
From the Medical (Neurologic) Division, Lakeside Hospital, and the Western Reserve University School of Medicine.

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TRAUMA

Chemical Arterial Injection.—Our concern is not with the ordinary mechanical injuries to peripheral nerves. This subject is well known as the result of civil and wartime injuries and has received adequate presentation, especially in the monograph of Pollock and Davis.[7] We wish rather to call attention here to a rare lesion caused by trauma to the vasa nervorum. Gammel [8] reported an instance in which a 48 year old man complained of pain in the foot following an intragluteal injection of bismuth and potassium tartrate. The patient complained of pain radiating from the hip to the sole of the foot and experienced difficulty in raising the ankle. A neurologic consultation by one of us (J. L. F.) revealed a paralysis of the peroneal muscles and diminution of sensation on the dorsilateral aspect of the foot. In the region of injection there was bluish discoloration of the skin of the buttocks. Gammel interpreted the condition as due to an injection into the inferior gluteal artery, which supplies an area of the buttock and also sends a branch to the sciatic nerve (arteria comitans nervi ischiadici). This theory was confirmed by a second case reported by Gammel.[9] This patient had also received a bismuth injection into the buttock, developed pain in the foot and showed evidence of a paralysis of the calf and intrinsic foot muscles due to involvement of the tibial branch of the sciatic nerve. In this case a biopsy of the skin and subcutaneous tissue revealed bismuth crystals in the vessels and marked inflammatory reaction in the perivascular tissues. Gammel's paper calls attention to similar cases reported by Freudenthal.[10]

EMBOLISM

An embolus traveling in the blood stream is a source of danger to the region of the body where it lodges. Fortunately the occurrence of recognizable embolic lesions in peripheral nerves is rare. Large emboli which occlude the main artery to a limb obviously cause more extensive damage than the mere ischemia of peripheral nerves, yet many of the symptoms and signs are explainable by the concomitant neuropathology. Scupham and de Takats [11] state "Locally, the characteristic findings are pallor, decreased cutaneous sensation, loss of heat, reduction or absence of reflexes, and paralysis."

McKechnie and Allen [12] have analyzed 100 cases of embolism and thrombosis of the peripheral arteries. Regarding ischemic neuropathy they have written "In cases in which sudden arterial occlusions do not lead to gangrene, the symptoms due to sudden occlusions may merge imperceptibly into those of ischemic neuritis. The pains tend to be paroxysmal and severe and to cover large areas which do not correspond to any definite nerve distribution. They may persist for weeks or months."

Collier,[13] in his Morison lecture on peripheral neuritis, in discussing neuritis observed during the course of fevers, stated that ". . . in very many of the cases the clinical picture was that of an isolated lesion of one peripheral nerve trunk, such as could be caused by a local settling of typhoid bacilli or by a vascular lesion. . . . The syndrome has not the aspect of a direct toxic neuritis. It may occur in many febrile conditions and not infrequently in pneumonia toward the crisis, and in this latter condition Hughlings Jackson was in the habit of referring it to a relative asphyxia of the lower nerve elements." Further in this essay, in discussing a type of diabetic neuropathy, he writes "The second variety, much less known and much more serious, is the rapid and painless onset of complete and irrevocable paralysis of one or more large peripheral nerve trunks . . . which was a thrombosis of the artery supplying the nerve trunk. . . ."

We have encountered embolic lesions of peripheral nerves infrequently. However, about a year ago we met this complication in an elderly Negro who was convalescing from type III pneumococcus pneumonia with bacteremia. Several days after the crisis he suddenly complained of inability to move his foot. A neurologic examination showed a loss of power of the peroneal muscle group and of the dorsiflexors of the foot. The muscles in the calf functioned well. There was an area of numbness over the outer portion of the dorsum of the foot. The sudden onset of complete loss of function of the peroneal nerve in a patient who had septicemia is best explained by the occurrence of an embolus to the nutrient artery of this nerve.

Tinel [14] mentioned several instances of neuritis and neuralgias of apoplectiform origin. It was his view that tiny hemorrhages might occur in the posterior nerve roots as the result of straining or lifting and thus produce symptoms of radiculitis. He pointed out that the symptoms were neuralgic and had no motor components. He cited two case histories, in one of which there was xanthochromic spinal fluid.

ARTERIOSCLEROSIS AND DIABETES MELLITUS

In Critchley's [15] lecture on "The Neurology of Old Age," several interesting observations are recorded relative to data on older persons which might be considered seriously abnormal in the younger age group. Sensory complaints such as stabbing, darting or aching pains and dysesthesias, particularly in the lower limbs, are quite common. Frequently there is a diminution in the vibratory sensibility, sometimes amounting to almost total loss of this sensation. The author refers to Pearson,[16] who found that there is a slight diminution in sensibility over the lower extremities, which becomes more noticeable decade by decade and may be pronounced after the age of 50. Likewise, appreciation of tactile and painful stimuli may be impaired or even lost. The tendon reflexes tend to become sluggish and may be difficult to elicit. "So frequently does this occur, in the absence of other neurological manifestations, that one is driven to the conclusion that absence of an ankle jerk in old age is without pathological significance." Critchley concludes that changes at all levels may play a role and that the impaired touch sensation is best explained by ". . . changes in the peripheral nerves, probably in the nature of senile or arteriosclerotic polyneuritis." Priestley [17] made histologic studies of the

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peripheral nerves removed from the amputated extremities in six cases of arteriosclerotic gangrene. He reported ". . . wallerian degeneration and fibrosis," more marked distally and appearing to be in direct ratio to the amount of arteriosclerosis. In a study of 280 cases of thrombo-arteriosclerosis obliterans, Hines [18] found ischemic neuropathy in twenty-two, or 8 per cent.

Diabetic "neuritis" has been interpreted differently for many years. Recently there has been a general tendency to consider it, at least in a large number of cases, as an ischemic neuropathy in which arteriosclerosis is a fundamental factor (Sandstead and Beams,[19] Needles,[20] Grinker,[21] Woltman and Wilder [22]). Clinically it is a painful neuropathy, with varying degrees of hyperesthesia and often extreme cutaneous tenderness (frequently worse at night). The distribution is over the distal portions of the legs and sometimes the forearms. It is uncommon under 40 years of age. Jordan [23] made an extensive review of 226 selected cases of diabetes mellitus with neuritic manifestations, of which seventy-two belong to the degenerative or circulatory type. These occurred in patients over 40 years of age and were accompanied by arteriosclerosis. The condition was usually progressive over a long period of time, although in some instances there was improvement. Woltman and Wilder [22] studied the spinal cord and peripheral nerve changes in ten cases of diabetes mellitus. They found degenerative changes in the spinal cord, which were milder than the changes in the peripheral nerves. In nearly all cases there was a thickening of the walls of the intraneural vessels. They conclude ". . . that the factor of greatest significance in the nerve lesions of diabetes is atherosclerosis." Collier [13] expressed a similar view: ". . . since the nerve trunk paralysis is only met with in people who are well above middle age, it is probable that atherosclerosis and the linear calcification of the arteries commonly occurring in diabetes is the fundamental cause of the sudden and final destruction of the large nerve trunk."

Recently Sandstead and Beams [19] found that the oral administration of sodium chloride to diabetic patients suffering with pain of neurocirculatory origin both relieves the pain and improves peripheral circulation (as was measured by the histamine reaction). They write ". . . this suggests that ischemia, the result of vascular disease, may be the cause of neuritic symptoms."

Because vitamin deficiency has been considered the etiologic agent in diabetic "neuritis," Needles [20] studied the vitamin B intake of three patients with this complication of diabetes mellitus. In each he found the vitamin/calory ratio above the required figure and concluded that it was perhaps due to vascular changes in the nutrient arteries to peripheral nerves.

THROMBO-ANGIITIS OBLITERANS

Pain and its control is one of the major concerns of the physician when confronted with a patient suffering from thrombo-angiitis obliterans. Since this clinical entity was first described by Buerger in 1917 the etiology of the pain has been the subject of speculation and research. Buerger [24] felt that the pain was due to a fibrosis about the nerve trunks which accompanied diseased vessels.

Brown, Allen and Mahorner [25] comment on the increase in perineural connective tissues and also on degenerative changes in the smaller nerves of the toes. They suggest the possibility of long standing ischemia, "approaching the threshold of tissue death" as the cause of these latter changes and of the pain. In a study of amputated extremities, Meleney and Miller [26] found complete occlusion of the vasa nervorum in half of the cases. In a clinical correlation these authors state that in every instance there was a history of excruciating pain. They state, however, that there were several patients who suffered severe pain in whose nerves no arterial occlusion was found. (It is possible that the occlusion might not have been discovered or have been the result of partial occlusion of a main arterial trunk.) Goldsmith and Brown [27] analyzed the cause of pain in 100 cases of thrombo-angiitis obliterans and considered that ischemic neuritis was present in twelve of that group. A recent contribution by Barker [28] consisted of the study of the nerves in seventeen amputated extremities from patients suffering from thrombo-angiitis obliterans. He reported an increase in the perifascicular and intrafascicular fibrosis. Patchy wallerian degeneration, diseased, coiled up and swollen axis cylinders, and some edema and atrophy were seen. Barker did not believe that these changes were due to obstruction of the vasa nervorum but was of the opinion that the nerve lesions came from ischemia as a result of the extensive occlusion of the main arterial trunks. In all cases in which "neuritic" pain occurred there was definite wallerian degeneration of nerves. The lesions were more pronounced than those described by Woltman and Wilder [22] in diabetes and by Priestley [17] in the arteriosclerotic group.

SYPHILIS

The role of the vascular changes in syphilis is too well known to require emphasis (Osler,[29] Boyd [30]). Warthin [31] has devoted considerable attention to the frequency of syphilitic periarteritis, panarteritis and arteritis obliterans of smaller arteries and believes that these occur to a greater or lesser degree. Herrmann [32] has described the various types of syphilitic arteritis of the extremities. Sézary [33] has covered the subject of neurosyphilis and stressed the frequency of arteritis as a cause of neurologic manifestation.

Involvement of peripheral nerves in syphilis is not common but has been described. Margulis [34] and Papow [35] have reported cases of syphilitic neuritis in which pathologic studies showed infiltration of the walls

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of the vasa nervorum with plasma cells and lymphocytes, resulting in endothelial thickening. Hassin [6] mentions the occurrence of syphilitic neuritis. Recently Simon and Berman [36] have discussed this subject with thoroughness and reported a case illustrated by photomicrographs. These pictures show unmistakable marked obliterative endarteritis and perivasculitis. They state "Syphilitic polyneuritis may occur in all stages of syphilis and its occurrence is not limited to the early stages. The fundamental pathologic process is panvasculitis, with lymphocytic and plasma cell infiltration in and about the walls of the blood vessels, associated with intimal proliferation, leading to obliterative endarteritis and endophlebitis."

PERIARTERITIS NODOSA

Periarteritis nodosa has neuritic manifestations. The symptom complex of Meyer [37] is often quoted: "Chlorotic marasmus, polyneuritis, and polymyositis symptoms . . ." Writers on this subject have placed the incidence of peripheral neuritis at from 20 to 40 per cent (Arkin,[38] Curtis and Coffey,[39] Kernohan and Woltman [40]). This arterial disease progresses through stages of degeneration, inflammation, granulation and finally fibrosis. Throughout this course thrombosis may occur, resulting in anemia of the organ supplied by such vessels. Ischemia is more apt to occur during the last stages, at which time there are mantles of scar tissue about the arteries. Arkin [38] and Kernohan and Woltman [40] have reported a series of cases in which there was definite peripheral nerve degeneration, proved at autopsy, caused by vascular lesions.

At the Lakeside Hospital, in the service of Dr. J. T. Wearn, there was a white man aged 32 who had entered the hospital complaining of migratory joint pains. Several months later there was a sudden left-sided hemiplegia. On this admission there were pallor, fever and left hemiparesis. This paralytic condition improved gradually and the patient regained the power of the left arm and leg.

On the tenth hospital day he complained of burning pain over the right foot. A day or two later there was weakness in the extension of the toes. Later there was complete paralysis of the dorsiflexors of the foot and of the peroneal muscles. The condition was a typical peroneal paralysis. This paralysis remained unchanged throughout the subsequent course of forty-two days. During this time there were pains in other extremities but no definite evidence of a peripheral nerve lesion. The autopsy (limited to the trunk) confirmed the earlier biopsy reports of periarteritis nodosa. It is very likely that the vessels in the peroneal nerve were gradually obstructed by this disease process.

POLYCYTHEMIA AND MISCELLANEOUS STATES

In polycythemia vera a number of factors are present which predispose to impaired local circulation and to thrombosis. These include an increased blood volume due to the increase in the red cells, decreased circulating minute volume and an increased blood viscosity (Harrop,[41] Haden [42]). Polycythemia vera is usually accompanied by marked arteriosclerosis and also capillary and arteriolar thickening and fibrosis (Reznikoff and Foot [43]). Most observers who have written on the clinical aspect of polycythemia vera have called attention to the frequent paresthesias and neuritic-like manifestations.[44] These usually consist of shooting pains and burning sensations in the extremities. The cause of these pains varies from patient to patient, for the lesion may occur at any point between the receptor organs in the skin and the sensory cortex in the cerebrum. There may be stasis in the surface capillaries and venules, which could account for the paresthesias. Interference with the cerebral blood flow, as reported by Christian,[45] may account for certain of the sensory symptoms.

At the Lakeside Hospital a patient with polycythemia has been studied over a period of years. During his various visits he complained of shooting pains radiating from the medial aspect of the right thigh to the foot. At the first admission the reflexes were intact. Later there was hyporeflexia, which progressed to areflexia in both lower extremities. It is suggested that the circulatory change may explain these evidences of neuritis.

Other types of arterial disease have been associated with neuropathy. Barker and Brown [46] reported a case of progressive disseminated obliterating arteritis in which wrist drop and partial paralysis of the peroneal nerves of both legs were present. Barker and Baker [47] reported a case of proliferative intimitis with symptoms of peripheral neuritis and recurring necrotic ulcers of the skin. At autopsy the peripheral nerves showed perineural and intraneural fibrosis and patchy loss of myelin sheaths. The vasa nervorum exhibited the same changes (proliferative intimitis) as did arteries and veins elsewhere in the body.

We observed manifestations of ischemic neuropathy in a patient whose illness was diagnosed as proliferative intimitis. He was a man aged 49 who gave a four day history of excruciating pain in the muscles of the forearms, hands, calves and feet. There was a marked tenderness to palpation of muscles in these areas. During his hospital stay the left patellar and achilles tendon reflexes disappeared and there was a marked diminution in sensation over the distal third of the foot. Because of the pain and early gangrene of the tips of the toes, amputation of this leg was carried out. The histologic picture included endarteritis obliterans with peripheral nerve changes consisting of edema and loss of myelin. When the patient was seen a year later he complained of intermittent stabbing pain and burning in the right leg, symptoms temporarily relieved by such vasodilators as glyceryl trinitrate and amyl nitrite.

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COMMENT AND CONCLUSION

This study indicates that in vascular disease, from whatever cause, peripheral nerve lesions may result with ischemia of nerve tissue as the common etiologic factor. As the causes of vascular pathologic changes are numerous, so the peripheral nerve lesions have been classified under several main headings. We have found such neuropathy in trauma, embolism, arteriosclerosis, Buerger's disease, syphilis, periarteritis nodosa and other states. Involvement of the main arterial trunk to a nerve or the simultaneous lesions in smaller branches and twigs is responsible for such ischemic changes in the nerve.

The local symptoms in each case depend on the nerve involved, the extent of pathologic alteration and the general status of the individual. Treatment should be directed toward the underlying pathologic process as well as to the symptomatic relief of the particular nerve lesion.

10465 Carnegie Avenue.

INCIDENCE AND INTERPRETATION OF DIABETIC-LIKE DEXTROSE TOLERANCE CURVES

IN NERVOUS AND MENTAL PATIENTS: A STUDY OF SIXTY-NINE SUCCESSIVE ADMISSIONS PRELIMINARY REPORT

G. WILSE ROBINSON Jr., M.D.
AND
PRIOR SHELTON, M.D.
KANSAS CITY, MO.

The relationship between disorders of the nervous system and the metabolism of the human organism has been the subject of much clinical and experimental study. The discovery of a carbohydrate catalyst, insulin, in 1923 made it possible for Sakel in 1933 to publish his revolutionary monograph on the treatment of schizophrenia with hypoglycemic shock induced by insulin. Appel, Farr and Marshall,[1] Bennett and Semrad,[2] Ziskind and Somerfeld-Ziskind[3] and others have reported beneficial effects from the use of small doses of insulin in various psychotic reactions of both the functional and the organic reaction types. We have observed beneficial effects from small doses of insulin and a high carbohydrate intake on such conditions as mild schizophrenia, psychoneurosis, chronic alcoholism, delirium tremens and arteriosclerotic conditions. We have reported on the use of insulin in the treatment of delirium tremens,[4] confirming the reports of Klemperer,[5] Puyuelo Salinas[6] and others. We have also reported on the use of insulin as a sedative,[7] following the original work done by Wegierko.[8]

Sakel[9] reported on the value of insulin in aiding in the withdrawal of morphine, and his observations have been verified numerous times in this country. While these clinical applications of insulin in nonshock doses were being studied, we were simultaneously investigating the effect of intravenous dextrose (10 per cent) in the various delirious phenomena, especially the so-called confusional states of old age.[10] This work has been confirmed by Larson and his associates,[11] who showed that the nutritional effect of the dextrose was the real beneficial agent and that the benefit was not due to the fluids which overcome the general organism dehydration or the hypertonic effects of hyperglycemia, which reduces cerebral edema. The dextrose provides needed nourishment, generally and locally, thereby correcting certain metabolic disturbances and reversing certain secondary pathologic states in the brain.

Insulin is the activating carbohydrate metabolism hormone, and intravenous dextrose in 10 per cent solution is the most effective way to provide the patient who is deficient in available carbohydrates with the only energy-producing food used by the brain—dextrose. Our interpretation of these mechanisms has been discussed in previous reports.[12] It seemed necessary from these observations to study our patients from the standpoint of basic physiology, to try to determine whether carbohydrate metabolism was disturbed and, if possible, how and why. It is our purpose in this paper to present a preliminary report of these studies.

We felt that the basic ability of the organism to utilize dextrose must be impaired in some way if these stimulations to carbohydrate metabolism brought about improvement in our patients. Carbohydrate metabolism is a progressive process from ingestion through absorption, storage, availability and oxidation to the usual end products of carbon dioxide and water. According to Chambers,[13] the simplest chemical test available at this time to study the integrity of the whole mechanism is the dextrose tolerance test We selected the four hour test, as outlined by Gradwohl,[14] as our investigative method so that the reaction might be studied throughout its course. We tested specimens of urine for sugar according to the Sheftel[15] method. Blood and urine determinations are made in this test after ingestion of 100 Gm. of dextrose in an aqueous solution. A fasting test is made and specimens are drawn at one-half, one, two, three and four hour intervals after a test meal. Samples of urine are collected at the same time. A normal dextrose tolerance test rises about 75 points above the fasting level in thirty minutes, falls sharply about 25 points in the next half hour and then gradually returns to the fasting level within four hours. There is no glycosuria at any time during the test. There are individual variations of this curve.

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Table 1.—*Blood* and Urine† Sugar Determinations*

Patient	Date	Specimen	Fasting	½ Hr.	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.
1. C. A.	7- 6-39	Blood	84.0	134.2	160.0	113.0	95.2	83.3
		Urine	Neg.	Neg.	3 plus	2 plus	Neg.	Neg.
	7-15-39	Blood	101.5	152.7	165.7	190.5	153.8	100.0
		Urine	Neg.	Neg.	Slight Trace	Neg.	Neg.	Neg.
2. R. A.	10- 2-39	Blood	81.6	148.1	93.9	109.3	105.3	64.5
		Urine	N. S.‡	N. S.	0.25	Neg.	Neg.	Neg.
	10-17-39	Blood	76.9	114.3	91.3	116.3	101.0	77.5
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
3. G. A.	10- 3-39	Blood	41.7	129.0	71.4	40.0	42.8	61.4
		Urine	0.25	1.0	0.25	Neg.	Neg.	Neg.
	10-28-39	Blood	78.1	143.9	135.1	60.0	51.9	70.9
		Urine	Trace	0.25	0.2	Neg.	Neg.	Neg.
4. A. B.	10- 2-39	Blood	69.0	230.0	153.8	144.9	72.7	54.5
		Urine	Neg.	0.2	0.25	0.25	Neg.	Neg.
	11- 1-39	Blood	90.9	135.1	125.8	102.0	68.5	57.1
		Urine	Trace	0.2	Trace	Neg.	Neg.	Neg.
5. W. B.	9- 1-39	Blood	114.3	163.9	227.3	190.5	129.8	40.0
		Urine	Slight Trace	Trace	3 plus	2 plus	1 plus	Slight Trace
	9-19-39	Blood	80.0	110.5	88.9	85.1	67.1	74.1
		Urine	Trace	Trace	Neg.	Neg.	Neg.	Neg.
6. L. B.	11- 5-39	Blood	74.1	122.0	115.6	76.3	64.9	65.4
		Urine	Neg.	N. S.	Neg.	N. S.	Neg.	Neg.
	12- 1-39	Blood	86.5	145.3	144.9	101.5	74.9	81.0
		Urine	Neg.	N. S.	Trace	Neg.	Neg.	Neg.
7. H. B.	7- 4-39	Blood	100.0	126.0	121.0	111.7	97.6	85.8
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
	9- 4-39	Blood	66.2	90.9	62.0	71.4	38.0	60.0
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
8. F. C.	7- 3-39	Blood	94.3	166.7	175.4	142.8	123.5	105.4
		Urine	Neg.	Neg.	Neg.	2 plus	Neg.	Neg.
	8-28-39	Blood	60.6	96.1	90.0	67.6	60.6	40.0
		Urine	Neg.	Trace	Neg.	Neg.	Neg.	Neg.
9. W. C.	7-29-39	Blood	78.5	149.2	181.8	146.0	85.1	58.8
		Urine	1 plus	2 plus	3 plus	4 plus	2 plus	Neg.
	8-23-39	Blood	76.9	139.8	169.5	97.8	N. S.	66.8
		Urine	Trace	2 plus	Trace	1 plus	Neg.	Neg.
10. J. C.	9- 5-39	Blood	70.2	138.9	235.3	161.3	51.7	129.0
		Urine	1 plus	N. S.	N. S.	N. S.	N. S.	N. S.
	10-16-39	Blood	84.7	128.2	140.8	97.6	51.5	63.9
		Urine	Neg.	Trace	0.1	Trace	Neg.	Neg.
11. M. D.	6-28-39	Blood	88.9	142.8	227.3	235.3	160.0	126.6
		Urine	Neg.	Neg.	Neg.	2 plus	1 plus	1 plus
	9- 2-39	Blood	66.6	93.0	137.9	117.5	98.5	57.1
		Urine	Slight Trace	N. S.	Trace	Slight Trace	Slight Trace	Slight Trace
12. T. D.	6-25-39	Blood	88.5	158.3	203.9	226.1	170.4	81.5
		Urine	1 plus	2 plus	3 plus	4 plus	4 plus	2 plus
	10-14-39	Blood	97.6	168.0	183.5	85.1	62.5	81.6
		Urine	Neg.	0.1	0.2	0.5	Neg.	Neg.
13. F. D.	6-14-39	Blood	104.2	161.4	204.1	105.1	65.6	116.3
		Urine	Neg.	Neg.	1 plus	1 plus	1 plus	1 plus
	10-18-39	Blood	85.1	181.8	217.4	86.6	109.9	51.7
		Urine	Neg.	Trace	1.0	0.75	Trace	Neg.
14. A. F.	9-18-39	Blood	90.9	114.3	142.8	N. S.	N. S.	N. S.
		Urine	Trace	N. S.	N. S.	N. S.	N. S.	N. S.
	9-23-39	Blood	83.3	116.3	N. S.	147.0	124.2	121.2
		Urine	Trace	Trace	0.15	0.15	0.15	Neg.
15. W. G.	7-21-39	Blood	70.7	198.1	168.0	148.1	110.5	60.6
		Urine	N. S.	1 plus	N. S.	1 plus	Neg.	Neg.
	11-30-39	Blood	86.6	107.5	181.8	73.3	68.0	64.5
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
16. F. H.	9- 7-39	Blood	77.6	112.4	175.0	160.0	117.6	71.4
		Urine	Trace	Trace	Trace	0.5	Neg.	Neg.
	11- 8-39	Blood	69.9	122.7	178.6	108.1	65.1	47.4
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
17. L. H.	10-25-39	Blood	86.9	130.7	129.0	90.9	70.4	67.8
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
	12- 1-39	Blood	90.5	136.0	141.8	111.7	57.6	55.5
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
18. A. H.	8-11-39	Blood	83.3	129.0	223.0	124.0	57.0	66.9
		Urine	Slight Trace	Trace	1 plus	3 plus	2 plus	1 plus
	9- 3-39	Blood	63.5	125.0	129.0	114.3	54.5	39.6
		Urine	Trace	Trace	Trace	Trace	Trace	Neg.
19. F. J.	8-13-39	Blood	60.0	114.3	185.0	131.5	75.5	74.1
		Urine	1 plus	N. S.	2 plus	2 plus	2 plus	2 plus
	10- 1-39	Blood	73.2	185.2	181.8	N. S.	N. S.	N. S.
		Urine	Neg.	Neg.	0.2	Neg.	Neg.	Neg.
20. G. J.	10- 9-39	Blood	93.9	137.9	190.5	153.8	72.7	41.0
		Urine	0.25	N. S.	0.3	5.0	2.0	Trace
	11- 1-39	Blood	77.8	106.9	115.3	137.9	108.1	49.3
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
21. N. K.	7- 8-39	Blood	95.2	123.5	114.3	105.8	94.6	105.6
		Urine	Trace	1 plus	2 plus	3 plus	3 plus	3 plus
	7-24-39	Blood	93.2	148.1	121.2	90.9	85.1	81.6
		Urine	N. S.	Trace	Neg.	Neg.	Neg.	Neg.
22. H. K.	11- 5-39	Blood	70.4	147.0	200.0	186.9	80.0	60.2
		Urine	0.5	0.15	0.15	5.75	0.75	Trace
	11-19-39	Blood	78.1	109.9	108.1	45.5	60.0	66.7
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
23. D. K.	10- 7-39	Blood	74.9	153.8	178.6	71.7	74.1	39.7
		Urine	Neg.	Neg.	0.25	Neg.	Neg.	Neg.
	11-30-39	Blood	75.5	144.9	119.7	119.0	60.1	73.5
		Urine	Neg.	N. S.	0.3	0.15	Neg.	N. S.
24. H. L.	8-26-39	Blood	84.4	190.5	223.0	235.3	153.8	92.6
		Urine	Trace	Trace	Trace	1 plus	1 plus	Neg.
	9-12-39	Blood	76.9	131.6	185.2	166.7	65.6	58.8
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
25. R. L.	7-31-39	Blood	71.4	84.0	117.6	97.1	55.5	64.5
		Urine	Trace	Trace	Trace	1 plus	1 plus	1 plus
	8-19-39	Blood	62.5	117.6	57.7	86.4	61.2	42.6
		Urine	Trace	Trace	1 plus	Trace	Trace	Trace
26. J. M.	11- 7-39	Blood	98.5	130.7	121.5	94.6	85.8	83.7
		Urine	Neg.	Neg.	0.2	0.2	0.2	N. S.
	12- 1-39	Blood	78.4	97.6	126.6	102.5	52.6	72.7
		Urine	Neg.	Neg.	0.15	0.10	Neg.	N. S.
27. W. M.	7-30-39	Blood	71.4	153.8	166.7	160.0	77.8	63.5
		Urine	Neg.	Neg.	1 plus	1 plus	Neg.	Neg.
	10- 7-39	Blood	72.7	116.5	151.5	94.3	52.6	69.0
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
28. F. P.	9- 2-39	Blood	82.0	175.4	250.0	173.9	76.3	46.4
		Urine	Trace	1 plus	2 plus	N. S.	N. S.	2 plus
	11-13-39	Blood	78.4	131.6	114.3	86.9	47.1	50.1
		Urine	Neg.	Neg.	Neg.	Neg.	N. S.	Neg.
29. M. P.	9- 3-39	Blood	65.6	160.0	250.0	156.2	73.5	55.6
		Urine	Trace	Trace	3 plus	4 plus	1 plus	Neg.
	11- 8-39	Blood	69.0	133.3	N. S.	125.0	74.1	50.8
		Urine	N. S.	N. S.	Neg.	Neg.	Neg.	Neg.
30. W. P.	10-10-39	Blood	77.3	121.9	152.7	143.9	90.9	72.7
		Urine	Neg.	N. S.	0.25	N. S.	1.0	0.25
	11-30-39	Blood	79.9	121.9	105.3	129.6	129.0	N. S.
		Urine	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.
31. N. R.	11- 4-39	Blood	61.5	142.8	136.0	124.2	67.1	108.9
		Urine	0.2	N. S.	0.2	N. S.	Trace	N. S.
	12- 1-39	Blood	78.4	107.5	148.1	162.6	114.3	61.9
		Urine	N. S.	N. S.	N. S.	N. S.	N. S.	Neg.
32. D. R.	7-30-39	Blood	148.1	210.5	235.0	250.0	250.0	153.6
		Urine	2 plus	2 plus	N. S.	N. S.	N. S.	N. S.
	11-17-39	Blood	94.3	104.2	163.9	95.2	103.6	108.1
		Urine	Neg.	N. S.	N. S.	Trace	N. S.	N. S.
33. D. S.	9- 8-39	Blood	82.6	170.9	200.0	200.0	114.3	56.3
		Urine	0.25	0.25	N. S.	4.0	3.0	2.0
	11-14-39	Blood	76.9	129.6	139.0	93.4	58.0	57.0
		Urine	Trace	0.15	0.15	Trace	Trace	Neg.
34. L. S.	9- 5-39	Blood	67.3	108.1	102.0	97.6	87.7	93.0
		Urine	Trace	N. S.	N. S.	Trace	N. S.	N. S.
	9-21-39	Blood	60.6	78.4	108.1	85.5	N. S.	N. S.
		Urine	Neg.	N. S.	Neg.	Neg.	N. S.	N. S.
35. E. S.	7-21-39	Blood	88.9	150.3	150.3	230.3	206.2	125.6
		Urine	Neg.	Trace	1 plus	2 plus	2 plus	Neg.
	8- 3-39	Blood	82.3	151.5	200.0	196.0	83.3	54.6
		Urine	Trace	Trace	2 plus	3 plus	Neg.	Neg.
36. S. S.	10- 3-39	Blood	50.0	66.7	185.2	153.8	76.9	69.0
		Urine	Trace	Trace	0.25	1.0	Trace	Trace
	10-28-39	Blood	87.7	88.1	88.5	104.7	77.2	51.7
		Urine	Trace	Trace	Trace	Trace	Trace	Trace
37. C. W.	8-17-39	Blood	59.7	132.4	175.0	88.9	93.1	43.0
		Urine	Slight Trace	Slight Trace	3 plus	3 plus	2 plus	1 plus
	9- 5-39	Blood	74.1	130.7	181.8	105.3	63.5	71.9
		Urine	1 plus	1 plus	1 plus	1 plus	1 plus	Trace
38. J. W.	9-15-39	Blood	77.5	89.7	97.6	69.0	80.3	81.6
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
	11-29-39	Blood	74.0	102.6	119.0	86.9	85.5	61.9
		Urine	Neg.	Neg.	Trace	Neg.	Neg.	Neg.
39. L. C.	10-22-39	Blood	95.0	106.9	97.1	81.0	71.2	83.0
		Urine	0.25	N. S.	N. S.	Neg.	N. S.	Trace
40. J. C.	8-18-39	Blood	76.3	129.0	187.0	140.8	72.7	60.6
		Urine	Trace	Trace	Trace	Slight Trace	Trace	Neg.
41. C. C.	10-10-39	Blood	77.5	117.3	134.7	80.0	112.4	55.5
		Urine	Neg.	Trace	Trace	Trace	Trace	Neg.
42. I. C.	6-24-39	Blood	90.5	122.7	129.0	144.2	70.2	88.9
		Urine	Neg.	N. S.	N. S.	N. S.	N. S.	Neg.
43. H. D.	8-26-39	Blood	64.9	169.5	166.7	137.9	123.5	63.5
		Urine	Slight Trace	Trace	1 plus	1 plus	Neg.	Neg.
44. M. D.	8- 3-39	Blood	95.2	160.0	206.0	197.0	160.0	117.5
		Urine	1 plus	N. S.	N. S.	N. S.	N. S.	N. S.
45. T. D.	9-13-39	Blood	74.9	129.0	113.0	112.4	78.1	77.2
		Urine	Slight Trace	Slight Trace	Trace	0.75	1.0	0.25
46. A. E.	10-18-39	Blood	70.2	93.4	112.0	149.2	151.5	84.4
		Urine	0.1	0.1	0.1	0.25	0.25	Neg.

TABLE 1.—*Blood* and Urine† Sugar Determinations—Continued*

Patient	Date	Specimen	Fasting	½ Hr.	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.
47. L. F.	10 9-29	Blood	93.0	161.3	170.9	129.0	108.9	66.6
		Urine	Neg.	Neg.	N. S.	Neg.	N. S.	N. S.
48. B. F.	10-22-29	Blood	98.0	139.9	192.3	194.2	190.5	88.9
		Urine	Trace	N. S.	N. S.	N. S.	1.25	N. S.
49. Geo. G.	9-19-29	Blood	75.5	129.0	121.2	93.0	44.1	66.6
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
50. Gi. G.	10-11-29	Blood	71.9	149.8	72.6	66.4	89.3	88.9
		Urine	N. S.	Neg.	Neg.	Neg.	Neg.	Neg.
51. C. H.	10-22-29	Blood	99.9	138.2	149.2	188.7	181.8	109.9
		Urine	Neg.	N. S.	Neg.	1.0	0.5	0.2
52. I. H.	9-18-29	Blood	225.2	227.8	600.0	392.2	344.8	220.0
		Urine	5.0	4.0	6.0	6.0	6.0	5.5
53. M. J.	7-14-29	Blood	125.5	190.5	295.0	202.2	256.0	216.5
		Urine	2 plus	3 plus	3 plus	4 plus	4 plus	4 plus
54. W. K.	10-19-29	Blood	72.7	121.2	118.3	118.3	102.6	47.6
		Urine	Trace	Trace	Trace	Trace	Trace	Trace
55. T. L.	7-17-29	Blood	114.3	190.5	268.9	137.9	122.0	86.2
		Urine	1 plus	N. S.	1 plus	N. S.	1 plus	N. S.
56. F. M.	7- 8-29	Blood	82.6	163.9	222.2	142.8	140.8	113.6
		Urine	Neg.	Neg.	3 plus	2 plus	1 plus	1 plus
57. E. M.	9-28-29	Blood	51.7	109.0	85.1	48.7	35.0	56.6
		Urine	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.
58. J. M.	6-30-29	Blood	93.4	198.1	200.0	217.4	109.0	65.6
		Urine	N. S.	N. S.	4 plus	N. S.	4 plus	N. S.
59. A. M.	7-27-29	Blood	61.5	125.9	130.7	86.9	81.6	45.4
		Urine	3 plus	N. S.	N. S.	N. S.	Neg.	Neg.
60. J. N.	10-22-29	Blood	85.5	150.4	129.8	70.2	70.4	69.1
		Urine	Neg.	0.25	0.5	0.2	Neg.	Neg.
61. B. P.	7-30-29	Blood	93.0	196.1	250.0	222.2	113.6	78.5
		Urine	1 plus	N. S.	4 plus	4 plus	2 plus	Neg.
62. C. P.	7-24-29	Blood	108.1	152.7	200.0	210.5	117.6	70.4
		Urine	N. S.	N. S.	N. S.	2 plus	3 plus	2 plus
63. W. S.	8-24-29	Blood	64.7	140.8	95.2	88.7	49.3	61.8
		Urine	1 plus	1 plus	1 plus	1 plus	1 plus	Trace
64. M. S.	11- 5-29	Blood	128.2	183.5	212.8	225.3	201.5	194.2
		Urine	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.
65. W. S.	9- 4-29	Blood	68.5	195.5	190.5	165.3	62.5	50.0
		Urine	Trace	Trace	2 plus	3 plus	Trace	Slight Trace
66. A. S.	9-18-29	Blood	81.0	134.3	136.0	97.6	69.6	62.2
		Urine	Neg.	N. S.	N. S.	N. S.	0.25	N. S.
67. T. S.	9-23-29	Blood	90.9	153.8	138.6	97.1	53.3	71.4
		Urine	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
68. J. W.	8-26-29	Blood	74.1	190.5	190.5	142.8	50.0	40.0
		Urine	Trace	1 plus	2 plus	2 plus	1 plus	Slight Trace
69. C. Z.	10-21-29	Blood	72.2	72.7	90.0	82.3	69.7	76.9
		Urine	Neg.	N. S.	Neg.	Neg.	Neg.	Neg.

* Blood sugar determinations given in milligrams of sugar per hundred cubic centimeters of whole blood.
† Urine sugar determinations given in (a) pluses (Benedict's qualitative) and in (b) per cent (Sheftel method).
‡ No specimen obtained.

Successive tests were made and from these comparisons we have been able to determine a rough estimate of the state of carbohydrate metabolism at the time of admission and the improvement in this factor during the clinical course of the patient. Normal results indicate proper absorbability from the gastrointestinal tract, normal passage through the liver, which takes up some but not all of the test meal, a normal mechanism for storing the excess blood dextrose as glycogen, and a normal oxidation of the dextrose in the tissues by the cells.

Variations from the normal in the curve do not indicate which factor is disturbed but only that some factor or factors are not functioning normally and that therefore carbohydrate metabolism, viewing the mechanism as a whole, is abnormal.

The interpretation of these curves has been difficult, since clinical studies on neuropsychiatric patients from this standpoint have not been done extensively. The chief use of the dextrose tolerance test in clinical medicine has been the determination of the presence or absence of diabetes mellitus. One of the latest reviews of the subject from this standpoint has been presented by Matthews and his associates.[16] They discuss the one hour-two dose tolerance test and its interpretation from the standpoint of the diagnosis of diabetes. Their comment is this: "Other causes of hyperglycemia being absent, a disturbance of the ability of the organism to prevent elevation of the blood sugar above what Hansen called the 'optimum concentration' ought to represent a criterion of diabetes mellitus." Hansen[17] used the term "optimum concentration" to designate the upper limit or blood sugar ceiling above which the blood sugar would not rise in normal individuals because of fluctuations in the activity of the regulation mechanism.

These other causes have been given but little consideration in discussions of this test in clinical literature. Diabetic and diabetic-like curves are common in nervous and mental patients. Table 1 shows our results on sixty-nine successive admissions. The first part of the table gives those in follow-up tests, while the second part is made up of those cases on which follow-up tests could not be made.

Table 2 shows the result of our application of three different criteria of interpretation of curves from the standpoint of the diagnosis of diabetes mellitus and other accepted types of glycosuria to the results in our series.

It is hardly conceivable that this high percentage of nervous and mental patients taken as they applied for treatment should have true diabetes mellitus or permanent hypo-insulinism. Only four of these patients had a fasting blood sugar in excess of 120 mg. per hundred cubic centimeters, but according to these interpretations of the dextrose tolerance curves from 39.9 to 62.3 per cent of the patients could be considered to have diabetes. All three of these criteria are methods advanced to simplify the classic procedure so as to eliminate some of the tests.

This group of patients had a variety of treatments which included insulin and metrazol shock, intravenous infusions of dextrose, insulin in small doses for metabolic and sedative purposes, thiamine hydrochloride and general hygienic help. Only one patient received definite treatment for diabetes. She had a fasting blood sugar of more than 200 mg. per hundred cubic centimeters consistently and had been treated for diabetes a number of years before she came under our care.

The clinical diagnoses of this group of cases included schizophrenia, manic depressive types, senile psychoses, alcoholism and other addictive states. Each clinical type was represented in the groups that could be interpreted as having a diabetic type tolerance curve. In many cases follow-up tests were made after an interval of a few weeks. Table 3 shows the results of the application of the foregoing three criteria to our follow-up tests.

It will be seen that, regardless of which criterion of interpretation is used, from 25.8 to 55.5 per cent of these curves return to normal under treatment that generally is not accepted as the proper treatment for diabetes mellitus. Those patients who showed improvement in their curves invariably showed symptomatic

16. Matthews, M. W.; Magath, T. B.; Berkson, Joseph, and Gage, R. P.: The One Hour-Two Dose Dextrose Tolerance Test (Exton-Rose Procedure), J. A. M. A. **113**: 1531-1537 (Oct. 21) 1939.
17. Hansen, K. M., cited by Faber, K.: Benign Glycosuria Due to Disturbance in the Blood Sugar Regulating Mechanism, J. Clin. Investigation **3**: 203-227 (Dec.) 1926.

improvement in the psychotic manifestations which were present at the time of admission. Some of the other patients who showed little improvement in their curves showed a complete psychotic remission, but follow-up tests in the future may show some improvement in their curves.

We feel that these abnormal curves result from malnutrition. The nervous and mental patient usually goes through a prolonged period before admission when hygienic habits are poor, diets are improper and various food superstitions are followed. General metabolism is frequently poor and malnutrition is a prominent feature. Physiologists have known for some time that carbohydrate metabolism is a mechanism of many factors, not simply the biochemical interplay of dextrose and insulin. We quote the opening paragraphs of Chambers'[13] recent comprehensive review:

Undernutrition is used in a broad sense in this paper to include complete inanition as well as the dietary deficiencies. Fasting has been recognized as a factor in carbohydrate metabolism since 1873, but the greatest expansion of the entire field has occurred in the past fifteen years. During this time the endocrine control of carbohydrate metabolism has been developed and now occupies a position of major importance. An attempt to correlate the studies of undernutrition and the endocrine research has led to the following generalizations concerning carbohydrate utilization.

TABLE 2.—*Interpretation of Tests by Proposed Criteria*

	A		B		C	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Total number of patients	69	100	69	100	69	100
Normal or nondiabetic	9	11.6	44	63.7	31	45.1
Diabetic or latent diabetic	42	60.8	25	36.3	28	40.5
Presumptive diabetic	(1)	....	(1)		10	14.4
Renal glycosuria	11	16.0	(1)		(1)	
Alimentary glycosuria	8	11.6	(1)		(1)	

(1) Not included in this interpretation.
A, according to the criteria of Exton and Rose (Diabetes as a Life Insurance Selection Problem, Proc. A. Life Insur. M. Dir. America **18**: 253-286, 1931).
B, according to the criteria of Gould, Altshuler and Mellen (The One Hour-Two Dose Glucose Tolerance Test in the Diagnosis of Diabetes Mellitus, Am. J. M. Sc. **193**: 611 [May] 1937).
C, according to the criteria of Matthews, Magath, Berkson and Gage.[14]

The maximum utilization of administered glucose is found in the normal individual when carbohydrate has been abundantly supplied in the diet. The minimum effect is obtained in the completely depancreatized animal which excretes all of the ingested sugar in the urine. Between these extremes is a series of less sharply defined intermediate stages. As the amount of carbohydrate in the diet is diminished the glucose tolerance test indicates a decreased utilization. During complete inanition there is a progressive deprivation of the carbohydrate stores in the body and an increasingly larger fraction of the test meal is lost by excretion as the fast continues. A more drastic and exaggerated condition is seen in the animal depleted by phlorhizin glycosuria. Approaching pancreatic diabetes at the lower end of the scale are the various stages of diabetes mellitus and the endocrine disturbances involving the pituitary and the adrenal. Of the many factors exerting a controlling influence on the different degrees of carbohydrate utilization as outlined, the importance of two is apparent—the amount of carbohydrate available to the cells and the endocrine control. The former seems to predominate at the beginning of the series but is superseded by the latter toward the minimum end. The literature presented in this review will give the evidence supporting these generalizations, with particular emphasis on the nutritional condition with respect to carbohydrate.

The conception of carbohydrate metabolism outlined above is based on the measurement of the body's ability to utilize carbohydrate, as determined by its reactions for several hours after the administration of pure glucose. When a glucose test meal is ingested sufficient in amount to maintain the maximum rate of absorption from the intestines for several hours, the total heat production of the body indicates that in the normal well-fed organism only about one-quarter to one-third of the absorbed sugar can be oxidized to CO_2 and H_2O. The major portion of the remainder is probably stored as glycogen, but conversion into fat, glycolysis to lactic acid, transformation into hexosephosphate, glycerophosphate, glucosamine, or other compounds may also occur. These reactions may be observed in several ways. The method most extensively used for the study of carbohydrate metabolism has been the glucose tolerance test in which the rise and fall in blood sugar concentration are determined for several hours after the administration of sugar. This test is most useful in showing small differences in utilization. It should be remembered that the blood sugar changes reflect the rate but not the nature of glucose utilization. If the impairment is large enough, information as to the total amount utilized may be obtained from the quantitative collection of the fraction excreted by the kidney. The most direct evidence for oxidation comes from carefully conducted determinations of the respiratory metabolism sufficient in duration to yield combustion quotients when interfering changes in the body are adequately controlled (Richardson, 1929). Tissue analyses yield data concerning glycogen deposition and other methods of disposal. All of these reactions must be considered in establishing a complete picture of carbohydrate utilization. The terms "utilization" and "oxidation" have been used synonymously in some of the recent literature. This is obviously inexact in short experiments.

Lehman[18] in 1873 and Claude Bernard[19] in 1877 showed that fasting animals had a glycosuria. This condition was termed "hunger diabetes" by Hofmeister[20] in 1890. Bang[21] showed that dextrose tolerance curves were disturbed in fasting animals, while Staub[22] showed that low carbohydrate-high fat-protein diets had the same effect. All this work has been confirmed experimentally and clinically many times.

From this background of physiologic observations it is easy to understand how neurotic, overanxious types, those who diet to lose weight, diet faddists in general or those who suffer from anorexia during physical or mental illness may upset their carbohydrate metabolism balance with depletion of reserves, suppression of secretion of body insulin and the development of toxic states from improperly metabolized fats and proteins.

Diethelm,[23] Wittkower,[24] McCowan[25] and Tod[26] have made reports on the disturbed dextrose tolerance found in certain abnormal emotional states and various psychotic reactions. The conclusions in the past have always been that the disturbance of the dextrose tolerance curve, signifying an abnormal utilization of dextrose, was the result of the mental condition being studied and that it had no etiologic significance. However, it is hardly necessary to point out that there is at this time no universally or even widely accepted single theory as to the "cause" of various abnormal mental reactions known as the psychoses or the neu-

18. Lehman, W. L.: Dissertation, Amsterdam, 1873; abstr. Arch. Exper. Path. u. Pharmakol. **2**: 463, 1874.
19. Bernard, Claude: Leçons sur le diabète, Paris, 1877.
20. Hofmeister, F.: Arch. f. exper. Path. u. Pharmakol. **26**: 355, 1890.
21. Bang, Ivar: Der Blutzucker, Wiesbaden, 1913.
22. Staub, H.: Untersuchungen über den Zuckerstoffwechsel des Menschen, Ztschr. f. klin. Med. **93**: 89 (Jan.) 1922.
23. Diethelm, Oskar: The Influence of Emotions on Dextrose Tolerance, Arch. Neurol. & Psychiat. **32**: 342 (Aug.) 1936.
24. Wittkower, Erich: The Influence of Emotions on Somatic Functions, J. Ment. Sc. **81**: 533 (July) 1935.
25. McCowan, P. K.: Manic-Depressive Psychosis—Symposium; Hyperglycemic Index as Aid in Prognosis, J. Ment. Sc. **82**: 599 (Sept.) 1936.
26. Tod, Henry: Studies in Carbohydrate Metabolism in Mental Disorders, Edinburgh M. J. **43**: 524 (Aug.) 1936.

roses. Therefore no factor can be ignored, whether it is psychologic, physiologic or biochemical. Relatively little is known definitely about the metabolism of the brain. Himwich and Nahum [27] and Himwich and Bowman and their associates [28] have shown that the brain in health uses only dextrose as its fuel, although in certain disease states a small amount of lactic acid may be utilized. They have further found that the metabolism of the brain is decreased in all the delirious conditions which they have investigated.[29] The rate of utilization of dextrose is high, amounting to about 14.6 mg. per hundred cubic centimeters or 10 per cent of all dextrose used by the body, and about 90 per cent of this 10 per cent is used by the cortical cells. Kerr and Ghantus [30] concluded that the brain cannot store a reserve of glycogen as can other tissue and that there must be a constant supply of sugar to the brain in order to maintain the level of free sugar so that constant, continuous, healthy metabolism may proceed. In addition to dextrose, the brain requires an adequate amount of oxygen (7.4 volumes per cent) and enzymes, and a marked variation from normal in either dextrose, oxygen or enzymes produces a pathologic condition in the brain. It is certainly not illogical to assume, therefore, that disturbed carbohydrate metabolism of the organism as a whole can and will disturb the functioning ability of the brain to some degree. It is of vital importance to determine eventually the exact place of this factor in the total picture. In the meantime, when a case with the nervous type of involvement is considered from the standpoint of therapy, this factor must be given consideration when the therapy is outlined, regardless of whether it is a primary or a secondary development.

Klemperer,[3] Puyuelo Salinas,[4] Robinson [4] and others have concluded that the toxic intermediate products resulting from the disturbed carbohydrate metabolism and disturbed liver function are largely responsible for the toxic type of disorders with the subsequent delirious symptoms found in cases of acute alcoholic psychoses (delirium tremens). In those cases the disturbances of metabolism are intense and are easily determined by a wide variety of laboratory tests.

Adlersberg and Porges [31] and Sweeney [32] have shown that increased carbohydrate in the diet raises and decreased carbohydrate lessens dextrose tolerance (i. e. ability to utilize dextrose). Himsworth [33] showed that in normal, healthy men the greater the carbohydrate content of the diet the greater the sensitivity of the organism to a measured dose of insulin, indicating that a high carbohydrate diet stimulates the secretion of body insulin and increases the efficiency of dextrose metabolism and utilization. The most important clinical lesson that can be learned from these tests is that glycosuria does not necessarily indicate diabetes mellitus (permanent hypo-insulinism), and that the so-called diabetic type curve in the dextrose tolerance test is not positive evidence of diabetes; that is, that the "other causes" are of considerable clinical importance.

It is also of clinical importance that the kidney threshold for sugar is not fixed, either for the human body in general or for the individual from time to time. In a series of investigations on patients with diabetes, Sidoni [34] concludes:

> No apparent quantitative correspondence existed between the blood sugar and the urine sugar in a large number of patients on protamine zinc insulin . . . as observed in our studies after regular prescribed meals. Probably renal functional disturbances which frequently escape detection by laboratory or physical means, brought about by the disturbed carbohydrate metabolism, were sufficient to interfere with the excretion of sugar in such a manner as to cause a partial loss and, at times, a marked loss of quantitative relationship between the urine and the blood sugar.

Our own records contain a number of cases that have been diagnosed diabetes in the past by other physicians. These patients either "spontaneously" recovered or, having been under treatment, usually self administered for many years, did not at the time of consultation with us show any evidence of a permanent hypo-insulinism, and therefore we did not consider that they had true diabetes mellitus. Exton [35] reported a series of 800 cases

TABLE 3.—*Changes in Curves as the Result of Therapy*

Diabetic Type: Actual, Presumptive and Latent	Total	Corrected	Not Corrected	No Follow-Up
Exton and Rose (A, table 2)...	40	7	11	24
Gould et al. (B, table 2).....	25	8	5	12
Matthews et al. (C, table 2)..	38	11	7	20

in which a reducing substance appeared in the urine. He found that less than 2 per cent of these patients had true diabetes mellitus. The staff members of the George F. Baker Clinic [36] feel that glycosuria is presumptive evidence of diabetes mellitus, although 14 per cent of 14,000 patients who entered the clinic with a diagnosis of diabetes mellitus had nondiabetic melliturias or glycosuria due to pentose, levulose and lactose in the urine.

CONCLUSIONS

1. An abnormality of dextrose tolerance is a common finding in nervous and mental patients. This indicates that there is a disturbance in the utilization of carbohydrates and that the whole metabolic function is disturbed. It may be one of the etiologic factors in abnormal nervous and mental reactions.

2. Regardless of its place in the etiologic picture, the dextrose tolerance should be corrected as quickly as possible during the general therapeutic management of the case. Only after improvement of feeling tone and general metabolism can special measures, such as shock therapy and psychotherapy be readily effective.

3. The diagnosis of diabetes mellitus in patients with a history of nervous and nervous type conditions must be made with caution, for only after a long period of observation and treatment to correct malnutrition, metabolic disturbances resulting from improper habits,

27. Himwich, H. E., and Nahum, L. H.: Respiratory Quotient of Brain, Am. J. Physiol. **102**: 446 (Aug.) 1932.

28. Himwich, H. E.; Bowman, K. M.; Wortis, Joseph, and Fazekas, J. F.: Brain Metabolism During Hypoglycemic Treatment of Schizophrenia, Science **86**: 271 (Sept. 17) 1937.

29. Himwich, H. E.: Unpublished data.

30. Kerr, S. E., and Ghantus, Musa: Carbohydrate Metabolism of Brain: Effect of Varying Carbohydrate and Insulin Supply on Glycogen, Free Sugar and Lactic Acid in Mammalian Brain, J. Biol. Chem. **116**: 9 (Nov.) 1936.

31. Adlersberg, D., and Porges, Otto: Zur Theorie und Praxis der kurativen Diabetesbehandlung, Klin. Wchnschr. **5**: 1451 (Aug. 6); **5**: 1508 (Aug. 13) 1926.

32. Sweeney, J. S.: Dietary Factors That Influence the Dextrose Tolerance Test: A Preliminary Study, Arch. Int. Med. **60**: 818 (Dec.) 1937.

33. Himsworth, H. P.: Discussion of Physiological Factors Influencing the Action of Insulin, Proc. Roy. Soc. Med. **29**: 658 (April) 1936; The Diabetic Factor Determining the Glucose Tolerance and Sensitivity to Insulin of Healthy Men, Clin. Sc. **2**: 67 (Sept. 30) 1935.

34. Sidoni, Anthony, Jr.: Blood Sugar Versus Urine Sugar as Observed in Patients Treated with Protamine Zinc Insulin and with Ordinary Insulin, J. A. M. A. **111**: 2303 (June 17), 2393 (June 24) 1938.

35. Exton, W. G.: Differential Diagnosis of Conditions Associated with Sugar Excretion, New York State J. Med. **36**: 1345 (Oct. 15) 1936.

36. George F. Baker Clinic, Boston: Advances in the Treatment of Diabetes: Class II Exhibit A. M. A. annual session, 1938.

nervous tension states and other factors as yet undetermined can such a diagnosis be made.

4. The physician in general practice should keep this fact in mind when he is consulted by patients who present a symptom complex of "nervousness," fatigue and ready exhaustability, vague somatic complaints and the picture that is usually diagnosed "psychoneurosis." If evidence of disturbed carbohydrate metabolism is found, a high carbohydrate diet with adequate insulin to insure combustion will be a valuable aid in the therapeutic program.

Neurological Hospital.

ADIPOSE TISSUE, A NEGLECTED SUBJECT

H. GIDEON WELLS, M.D.
CHICAGO

(Concluded from page 2183)

LIPOMAS

Lipomas are in a way analogous to steatopygous deposits except that they are not constant in their distribution. Although not racial they may at least be familial. Blaschko [43] has reported a family in which all the males of two generations exhibited multiple subcutaneous lipomas, the growths appearing first at puberty; none of the females of this family had lipomas. Unfortunately he gives no further details. Ewing quotes Murchison, who reported a family in which a father and three daughters exhibited multiple subcutaneous lipomas while nine sons were free of this condition. Other examples of familial lipomas have been reported by Meerbeck, Petre, Leven [44] and others.

Those who have been so fortunate as to secure specimens exhibiting early stages of lipoma formation (Borst, Bender) have found evidence that the lipoma arises like normal fatty tissue from a preadipose tissue derived from embryonic mesenchymal tissue. Even the so-called heteroplastic lipomas, arising in places where adipose tissue does not ordinarily exist (e. g. the meninges, kidney, periosteum), are believed by Chiari to arise from embryonic misplacement of true adipose tissue or preadipose tissue. Mallory [45] has described a subcutaneous lipoma with the cells exhibiting the moruloid structure of glandular adipose tissue occurring in an adult. This tumor resembled the glandular adipose tissue of emaciated infants in being reddish yellow and very vascular. Some early liposarcomas so closely resemble reticuloendothelial tumors as to indicate the common origin of adipose and lymphatic tissues.

Lipomas exhibit a number of interesting features, often being something more than merely circumscribed overgrowths of adipose tissue. Because of the insulating quality of fat, the skin over a lipoma is distinctly cooler than in the corresponding area of the other side of the body, which is a point that may have some diagnostic value. They may appear as symmetrical growths and hence present a problem as to etiology. In some such cases a particularly close connection to nerves may be demonstrated (Chiari) and the tumors may be tender or painful,[46] but what the relation of the nervous tissue to the etiology of the growths may be cannot now be stated. Such a condition recalls the "adiposis dolorosa" of Dercum. Cases have been described of multiple symmetrical lipomas appearing after a spinal injury which strongly support the idea that the nerves are in some way responsible, perhaps through trophic influence. They occur mostly after the age of 40 and most often in females (73 per cent of 134 patients in one series [47] were females). Adair, Pack and Farrior [47] say that when they are multiple lipomas are usually neurolipomas. They observed one instance in a 5 months infant, and Jacobi [48] said that in the literature he had found "less than thirty cases of congenital lipomas" up to 1884.

Even benign lipomas may contain immature cells, arousing suspicion of a beginning malignant growth, which is explained by the fact that mature fat cells seem to be unable to proliferate, and growth is accomplished by immature cells.[49] Occasionally lipomas do take on a malignant character, and then they demonstrate nicely the embryonic origin of fat in relation to the primitive myxomatous connective tissue of the early fetus, for such malignant growths are composed of a mixture of adipose and myxomatous tissue, descriptively called liposarcoma myxomatodes, or lipomyxosarcoma. Such tumors may reach great size, especially in the retroperitoneal region. I have observed one that weighed 69 pounds (31 Kg.) [50] Martin [51] has reported a benign subcutaneous lipoma with teratomatous areas which in fifty-eight years grew to a weight of 59 pounds (27 Kg.).

Ewing [52] recognizes two types of liposarcoma: (1) an adult fat cell type composed of granular cells resembling those found in chronic inflammation of fat tissue, which may be their starting point; (2) embryonal liposarcoma or lipomyxosarcoma, which exhibits a proliferation of minute vessels, the adventitial or endothelial cells of which, instead of producing fat, form chiefly mucus and occasionally embryonal fat tissue. "The cells, steatoblasts and lipoblasts, are derived from the adventitial layers of the blood vessels. They first appear as granular nucleated cells lying in the rich capillary network and producing a structure which resembles liver tissue. . . . Mucous tissue often appears in the fat anlage." An orange colored lipoma suggests origin from brown fat. Gricouroff [53] says that in the embryonic lipoma the myxomatous feature is provided by the stroma rather than the tumor cells, which accords with my own observations.

A particularly interesting feature of lipomas is their relation to the normal storehouses of fat, for there is a widespread belief that the fat in the lipomas is not available to the host as a source of nourishment. This is based on certain reputed instances in which the bearer of a lipoma is said to have become greatly emaciated from some intercurrent disease, notwithstanding which the lipoma either has remained its original size or has continued to grow. Despite the currency of this belief, it is difficult to find specific evidence as to its validity.

43. Blaschko, H.: Virchows Arch. f. path. Anat. 124: 175, 1891.
44. Leven: Dermat. Wchnschr. 87: 1563 (Oct. 6) 1928.
45. Mallory, F. B.: Pathological Histology, 1939, p. 304.
46. Emil Ries (Am. J. Obst. & Gynec. 34: 490 [Sept.] 1937) has reported finding painful episacro-iliac lipomas as a common cause of backache, no less than 317 of 1,000 persons examined showing lipomas in this location.
47. Adair, F. E.; Pack, G. T., and Farrior, I. H.: Am. J. Cancer 16: 1104 (Sept.) 1932.
48. Jacobi, A.: Arch. Pediat. 51: 78 (Feb.) 1934.
49. Jaffé, R. H.: Recurrent Lipomatous Tumors of the Groin, Arch. Path. 1: 381 (March) 1926.
50. Hirsch, E. F., and Wells, H. G.: Am. J. M. Sc. 150: 356 (March) 1920.
51. Martin, H. S.: Massive Lipoma of the Subcutaneous Tissue of the Back, J. A. M. A. 90: 2013 (June 23) 1928.
52. Ewing, James: Fascial Sarcoma and Intermuscular Myxoliposarcoma, Arch. Surg. 21: 507 (Oct.) 1935. Pack, G. T., and Anglem, T. J.: J. Pediat. 15: 372 (Sept.) 1939.
53. Gricouroff, Georges: Bull. Assoc. franç. p. l'étude du cancer 27: 251 (March) 1938.

According to Shattock, this belief depends largely on the teaching of Paget, based on a specimen in the museum of St. George's Hospital, with lipomas in the mesentery of a patient with phthisis from whom nearly all the natural fat had been removed; and on a case reported by Schuh of a man with masses of fat in the head, throat and chest, although the abdomen and legs were very thin. Shattock reexamined the St. George specimens, preserved since 1843, and found that some of the masses were lipomas but that some were caseous lymph nodes.

Many years ago (1912) I [54] investigated this question and found that, as far as the literature was concerned, the evidence was conflicting. Several general statements and but few specific case reports could be found. Of these, some agreed with Paget's idea, others described decrease in size of lipomas during emaciation. The possibility that lipomas might behave in either way is offered by analogy with other localized collections of adipose tissue. Thus, the fat of the camel's hump and of the steatopygous decorations of the Hottentot are drawn on for nourishment when needed, but the sucking pad of the infant's cheek usually retains its fat even in extreme emaciation. Malignant fatty tumors offer an undoubted case of accumulation of fat in spite of most severe depletion of fat from the normal fat depots, for nearly all the cases reported in the literature exhibited marked emaciation.[55]

In my own case of liposarcoma referred to previously, which presented the largest solid tumor of which I can find certain record, the patient was emaciated to the maximum degree. Although there were several pounds of fat and protein in the tumor that might have been used for nourishment, it evidently was not available to the wasting organism, for not only was the subcutaneous fat lacking but even the more resistant perirenal adipose tissue had become almost completely depleted of its fat stores.

But in respect to benign lipomas the matter is not so clear, for well studied case reports of the influence of general nutrition on the weight and dimensions of these growths are lacking. The massive accumulations of fat sometimes seen in the neck and called "Madelung's neck," are said by Madelung [56] to remain unchanged during emaciation, but these are perhaps not true lipomas. I have recently seen a small (1.5 cm.) lipoma with fat-distended cells standing out in the extremely defatted omentum (fig. 5) of an old man dying of gastric cancer, his weight being but 90 pounds (41 Kg.). In progressive lipodystrophy it has been observed that a lipoma present in the subcutaneous tissues in the area that became depleted of fat remained distended with fat.[57]

Why the wasting body cannot utilize these pathologic fatty masses is an unsolved problem. The few chemical studies of lipoma fat show no differences recognizable by present methods between the fat of lipomas and normal subcutaneous tissues. d'Argenio [58] says that lipomas contain myelins, which are absent in subcutaneous fat tissue. If so, this serves to rank lipomas with multilocular adipose tissue, which may explain its failure to resorb as readily as depot fat tissue.

54. Wells, H. G.: The Fat Metabolism of Lipomas, Arch. Int. Med. **10**: 297 (Oct.) 1912.
55. Some patients with advanced cancer retain a high degree of adiposity. This paradox has been attributed in some cases to metastasis in the hypophysis, but this explanation does not generally hold, and Mathias (Verhandl. d. deutsch. path. Gesellsch. **26**: 289, 1931) believes that anemia from hemorrhage or bone marrow metastases is responsible for adiposity in some cases.
56. Madelung, O. W.: Arch. f. klin. Chir. **37**: 106, 1888.
57. Christiansen, V.: Rev. neurol. **38**: 1169 (Sept.) 1922.
58. d'Argenio: Folia med. **10**: 809, 1924.

It must be admitted not only that malignant tumor cells can build up their own cellular structure of proteins, which are inaccessible to the rest of the wasting body, but can also lay on and withhold fat, which seems in all respects to resemble the normal stored food needed by the emaciated patient. Since normal tissues do not ordinarily store fat for their own use but for the use of the entire organism, this holding of fat by tumor cells when the rest of the body needs it is entirely out of harmony with normal fat metabolism and challenges explanation. Certainly no anatomic peculiarity is known to explain the unavailability of lipomatous fat; there is plenty of blood supply to bring in the fat, so why cannot it be drawn out again? I have tried to see whether there is any difference between the enzymes of lipomas and normal adipose tissue,[54] but, as far as the available means disclosed, lipoma tissue exhibits much the same lipase activity as adipose tissue, and lipoma fat was hydrolyzed by pancreatic juice as readily as fat from normal human adipose tissue.

Fig. 5.—Lipoma of omentum (above) retaining its fat during extreme emaciation which has depleted the omental fat tissue (below). The man died of carcinoma of the stomach; he weighed 90 pounds (41 Kg.). Slightly reduced from a photomicrograph with a magnification of 145 diameters.

The apparently anomalous behavior of fat deposits in lipomas suggests that the laying on and giving up of fat in adipose tissue does not depend on a simple reversible reaction, either chemical or physical. It would seem that these processes must be independent of each other and therefore each the result of a special activity of the fat cells. Perhaps in some tumors the cells differentiate only enough to accomplish the storage function, whereas in other tumors both functions are possible, and these lipomas are the ones that are seen to waste away during emaciation. Other tumors derived from the same cells may fail in large measure to acquire

even the storage capacity and appear as the embryonal type of lipomas, which may resemble reticulum cell tumors.

DIFFUSE SYMMETRICAL LIPOMATOSIS

Besides the occurrence of well circumscribed lipomas in symmetrical locations, and with evident or apparent relation to nerve trunks, there is a group of most interesting conditions characterized by symmetrical excess of adipose tissue in diffuse form. This includes the "fat neck" of Madelung and many of the cases of "adiposis dolorosa" or Dercum's disease. Here too there is a relation to the nervous tissues as shown by the tenderness of the diffuse fat deposits, so that the relation to the circumscribed symmetrical lipomas is a close one. Indeed, within the diffuse fatty deposits of symmetrical adiposity there may also occur circumscribed areas resembling simple lipomas. These conditions have been well described and analyzed as understood in 1910 by Lyon.[59]

Fat neck was described by Brodie in 1846, and many cases had been described in England and elsewhere when Madelung published his paper in 1888 in Germany. Therefore it is called Madelung's neck. The disease is characterized by symmetry, diffuseness and special localization of the fatty tumors, but the symmetrical tumors may not arise at the same time. Usually there are fatty deposits in other parts of the body besides the neck, which may appear later or earlier than the others. After removal the tumors do not recur, although new formations may occur about the periphery. It occurs chiefly in men, especially often in alcoholic addicts. Usually these subjects are in good health but occasionally they exhibit such constitutional symptoms as neuritis, arthritis or vasomotor disturbances. It is said that the fatty masses do not disappear spontaneously or vary with changes in the general state of nutrition. Lyon says that the constitutional symptoms of general adiposity, nodular lipomatosis and diffuse symmetrical lipomatosis are essentially the same. Frequently the types blend in such a manner that they cannot be distinguished from one another.

A relation to the ductless glands is shown by all these conditions; in some there is genital hypoplasia, in others changes in the thyroid or pituitary. Thyroid feeding is sometimes of benefit. The fatty tissue shows no characteristic histologic features and seems to be derived from ordinary adipose tissue and not from the special lobulated fat tissues.

Adiposis dolorosa was the appropriate name proposed by Dercum in 1892 for a group of these cases of generalized adiposity in which pain in the fat deposits is an outstanding feature. But, as already indicated, there is no sharp line between adiposis dolorosa and general obesity on the one hand and diffuse symmetrical lipomatosis on the other, for in both these conditions there is more or less tenderness, commonly manifested in the fatty deposits. In typical adiposis dolorosa, asthenia is usually present, often profound, and psychic abnormalities are often manifested. The chemical composition does not differ recognizably from that of normal adipose tissue.[60]

There is nothing constant about the fat deposits, which may be diffuse, nodular or both, symmetrical or irregular, slight or very extensive. Usually the hands, feet and face escape. Likewise the degree and character of the neuritic and psychic disturbances are extremely varied. Vasomotor instability, anhidrosis or hyperhidrosis testify to the sympathetic disturbances. Many trophic changes, including loss of hair, pigmentation and cutaneous ulcers, have been described.

Although a neuropathic family history is common, familial occurrence and hereditary influences are said not to be common, but Lyon believes that this is often overlooked. Reversing the relation in symmetrical lipomatosis of the neck, females greatly outnumber the males. Often it follows the climacteric. Although thyroid treatment sometimes improves the condition, it rarely if ever cures.

The fat deposits may contain separate embedded lipomas but in general exhibit no specific characters. An interstitial neuritis in the fat deposits is commonly described in the cases examined. Although the thyroid is seldom altogether normal, the changes described are so variable as to fail to establish a relation to the disease. Probably the thyroids of an equal number of persons of the same age dying from any chronic disease would show comparable conditions. The pituitary gland has shown more marked changes, sometimes neoplasia, suggesting a relation to hypophysial dystrophies. Up to the present time the etiology is entirely unknown, but the relation to hypophysial, thyroid and genital dystrophies seems to be indicated.

As Lyon says, it would be easy to collect cases ranging from normal through simple obesity to adiposis dolorosa. Many women who are not obese show tender baggy fat deposits on the arms and hips which differ chiefly in degree from diffuse symmetrical lipomatosis and adiposis dolorosa. Any one or more of the cardinal symptoms of the latter may be present in a given case of obesity, and even cases presenting all the symptoms (asthenia, tenderness, psychic symptoms) except obesity are seen. Anders[61] described as "adiposis tuberosa simplex" cases of common obesity presenting tender fatty lumps in the adipose tissue. Furthermore, as mentioned before, cases of multiple nodular lipomas occur which exhibit tenderness without obesity and with or without other constitutional disturbances. Lyon finds that heredity plays a large role in these various forms of local adiposity and that different types may occur in relatives, indicating the lack of individuality of the types.

Fröhlich's syndrome is another illustration of an adiposity which in some cases verges on the adiposis dolorosa group and on the other side simulates the genital adiposities. I have seen a case that seemed clinically to be typical Fröhlich's syndrome which at autopsy showed congenital syphilis with severe arterial involvement and a structurally normal hypophysis. Also I have examined the body of a man with both testicles destroyed by syphilis who exhibited extreme obesity with a fat distribution recalling these syndromes. This corresponds with the observations of Tandler and Grosz[62] on the similarity of the changes in hypophysial and testicular hypofunction. In castration obesity, as in simple constitutional obesity, the fat accumulation is said not to be entirely dependent on oversupply of fat, for these persons continue to gain weight on a restricted diet. Umber has described a case of obesity following oophorectomy in which the weight remained constant on a diet supposed to furnish only 900 calories a day. Such statements seem to suggest that the law of conservation of energy has been repealed.

59. Lyon, I. P.: Adiposis and Lipomatosis, Arch. Int. Med. 6: 29 (July) 1910.
60. Page, I. H.: Virchows Arch. f. path. Anat. 279: 262, 1930.
61. Anders, J. M.: Am. J. M. Sc. 135: 325, 1908.
62. Tandler, J., and Grosz, S.: Wien. klin. Wchnschr. 21: 277, 1908.

Lipodystrophia progressiva [63] is a remarkable and puzzling condition, characterized by loss of fat in the upper part of the body even to the degree of emaciation, while fat remains abundant and usually excessive below the waist line. The title "lipodystrophia cephalothoracica," proposed by Maranon and Alvarez Cascos,[64] gives a more accurate impression of the nature of the malady, for after a short period of progression the condition remains stationary. However, in a case reported by Bigler [65] the loss of fat was in the lower extremities, with persistence of the fat in the cephalothoracic region. Overfeeding causes fat to increase in the lower parts of the body but not in the emaciated parts. In one case a lipoma present in the upper part of the body persisted when the subcutaneous fat disappeared.

Like adiposis dolorosa, it occurs chiefly in females (about 2 to 1). In two cases reported with necropsies the fat in the body cavities was normal, as were the endocrine glands. The supposed relation to endocrine disturbances is supported by the fact that some patients with this dystrophy exhibit a redistribution of fat under thyroid feeding, the dimension of the hips decreasing while the axillary circumference increases (Beck); but others have not confirmed this. The general health is good, as are the sex functions. It is probable that minor degrees are common, and even frank cases are probably not so rare as the literature suggests, for Parmelee [66] was able to report six cases.

The hormone factor in these cases is, however, hard to reconcile with the topographic limitation, as it is in cases in which the adiposity is unilateral, but it must be recalled that unilateral acromegaly has been described. Trophic nerve changes are often present, which serves to relate this condition with adiposis dolorosa and the rest of the lipodystrophies. Microscopic study shows merely a loss of fat tissue from the subcutaneous tissue of the dystrophic part of the body without persistence of the embryonal type of defatted adipose tissue cells as occurs in ordinary emaciation, at least in the case (Bigler's) I have examined. This disappearance of fat cells explains the inability of the affected subcutaneous tissues to store fat, no matter how much is assimilated.

Maranon and Alvarez Cascos, who say that this condition is especially common in Spanish women, suggest that it is merely an individual exaggeration of a tendency for an irregular distribution of subcutaneous fat often seen in less degree in women, dependent on chromosomal constitution and perhaps augmented by endocrine abnormalities, especially hypothyroidism, which is present in 20 per cent of the cases. As pointed out by Lauter and Terhedebrügge,[67] in thyroidogenous emaciation the buttocks retain relatively more fat while the thorax loses relatively more. No consistent changes have been found in the endocrine organs.

GENERAL OBESITY

The topic general obesity covers so much ground that it is not feasible to discuss it within the space of this paper, nor is it really a disease of fat tissue but of general metabolism, so I shall refer to only one phase of its experimental study, which, having been presented outside the medical literature, has been overlooked in most discussions of obesity. This is the experimental demonstration of the significance of heredity for the occurrence of adiposity, and important possibilities opened for future studies on obesity, by the observations of Danforth [68] of Stanford University on hereditary obesity in mice. In a strain of yellow mice there occurs a pronounced form of adiposity, more marked in females, which is associated in cross breeding experiments with the yellow color. These animals lay on much more fat than control mice on the same diet, and this fat can be utilized when required by fasting. That human obesity is in large measure determined by heredity has been shown by numerous clinical studies, among the more recent of which may be mentioned the report of Gurney.[69]

PATHOLOGY OF ADIPOSE TISSUE

Beyond the various types of overgrowth previously discussed, little has ever been said or written about diseases of this widespread and quantitatively important tissue. That it may play any part in systemic disease seems never to be considered. But when one observes the character of the fat cells when they are free from fat and notes their abundant cytoplasm and the gland-like vascularization of adipose tissue, the possibility presents itself strongly that such a tissue may play a part in general metabolism which has been overlooked, until recent studies, cited previously, have shown its function of converting carbohydrate into fat. The presence of great deposits of fat in the cells need not prevent their exhibiting active metabolism, since the cytoplasm is outside the fat and in close relation to the blood supply. As stated previously, I have found that the production of maximum degrees of fatty deposition in liver cells does not appreciably decrease their capacity to oxidize uric acid. The work of Wassermann, indicating that adipose tissue is part of the reticulo-endothelial system, suggests that it may play a part in immunity. The demonstrated role in fat formation indicates functional activity not formerly suspected and supports the suspicion that other unrevealed activities may also be going on in this neglected tissue.

When extensive fatty changes are produced in the liver and other parenchymatous organs by phosphorus, arsenic and other steatogenic poisons, the fat, at least in part, comes from the adipose tissue depots, for extreme emaciation may interfere with the production of this fatty metamorphosis.[70] Balan [71] says that in phosphorus poisoning the adipose tissue fat becomes so altered that it stains with nile blue, indicating a change in the state of the stored fat, presumably related to its transportation.

NECROSIS OF ADIPOSE TISSUE

Only a few disease processes have been recognized as affecting adipose tissue itself. Perhaps most discussed is the focal necrosis of the fat tissue that occurs when adipose tissue comes in contact with pancreatic juice. Here the cleavage of the fat by the lipase is followed by soap formation, giving rise to the characteristic circumscribed opaque white areas in the adipose tissue. By using lipase from vegetable sources and artificial lipases, as well as pancreatic enzymes, Neal and Ellis [72] have shown that lipase rather than trypsin

63. Watson, W. N. B., and Ritchie, W. T.: Quart. J. Med. **18**: 224 (Jan.) 1924 (review of early literature).
64. Maranon, G., and Alvarez Cascos, J.: Endokrinologie **6**: 87 (Feb.) 1930.
65. Bigler, J. A.: Loss of Subcutaneous Fat of the Lower Extremities (Lipodystrophy), J. A. M. A. **112**: 627 (Feb. 18) 1939.
66. Parmelee, A. H.: Lipodystrophy, J. A. M. A. **98**: 548 (Feb. 13) 1932.
67. Lauter, S., and Terhedebrügge, A.: Deutsches Arch. f. klin. Med. **181**: 193, 1937.
68. Danforth, C. H.: J. Hered. **18**: 153 (April) 1927.
69. Gurney, Ramsdell: The Hereditary Factor in Obesity, Arch. Int. Med. **57**: 557 (March) 1936.
70. Wells, H. G.: Chemical Pathology, ed. 5, Philadelphia, W. B. Saunders Company, 1925, p. 447.
71. Balan, N. P.: Beitr. path. Anat. u. z. allg. Path. **76**: 198 (Dec. 30) 1926.
72. Neal, M. P., and Ellis, M. M.: Tr. Chicago Path. Soc. **13**: 218 (June 1) 1930; J. Missouri M. A. **32**: 37 (Feb.) 1935.

is responsible for pancreatic fat necrosis. Pure pancreatic juice will not produce fat necrosis unless activated by intestinal juice,[73] and presumably by tissue kinases. Rewbridge [74] has shown that bile in the peritoneal cavity may produce fat necrosis, apparently through affecting tissue permeability so that the enzymes escape from the pancreas. The products of the fat cleavage seem to have no part in the toxic state that results from the acute pancreatitis or peritonitis which often accompany peritoneal fat necrosis.

A similar condition, at least morphologically, is sometimes seen where fat tissue has been traumatized, even without the possibility of contact with pancreatic juice. It has been described chiefly in the subcutaneous fat tissue of the abdominal wall and the female breasts.[75] As many of the cases occurring in the female breast present no history of trauma, it is possible that it may sometimes result from escape of duct contents into the adipose tissue,[76] and in some cases it may be part of a generalized disease of adipose tissue, nonsuppurative panniculitis. It is not infrequently seen in fat cattle killed in the Chicago stock yards and presumably is the result of the traumatisms that occur during transportation. Also it may result in infants from birth trauma.[77]

SCLEREMA NEONATORUM

A remarkable pathologic condition of adipose tissue is seen in the condition known as "sclerema neonatorum," [78] in which the subcutaneous adipose tissue becomes hard and rigid, like chilled fat. In those cases in which the process is diffuse, the affected infant may feel like the body of a fat sucking pig brought out of the refrigerator. Sometimes the process is localized, and the affected areas may undergo necrosis, even with subsequent calcification, constituting "adiponecrosis subcutanea neonatorum." This condition seems to depend on a deficiency in olein in the subcutaneous tissues, which causes the adipose tissue to have an abnormally high melting point.[79] The resulting mixture of stearin and palmitin crystallizes at body temperature and the crystals may incite an inflammatory foreign body reaction.[80] According to Harrison,[81] these crystals have a melting point of from 40 to 50 C., whereas crystals from the fat of normal infants melt at 30 C. Whether the deficiency in triolein responsible for the raised melting point is a developmental defect or a postnatal abnormal utilization of the olein is not known. In infants with such abnormal fat, obstetric trauma is usually the cause of the local necrosis, ordinarily noted only in the subcutaneous tissues, but occasionally in the perirenal fat.[82] Siwe [83] says that when adults exhibit adiponecrosis their fat is found to exhibit the same excessive proportion of palmitin as is seen in affected children and that similar changes may be obtained in animals injected with palmitin and palmitic acid.

LIPOGRANULOMATOSIS

Local necrosis of adipose tissue from whatever cause may stimulate proliferative reactions leading to the formation of what are essentially foreign body tubercles but with special characteristics because of the abundant lipophage cells and often multinucleated foreign body giant cells. At times the fat is set free to form small oil cysts surrounded by a zone of macrophages and giant cells.[84] In other cases the abundance of proliferating cells has suggested the presence of a neoplasm, and it is probable that dermatologists have looked on these "lipophage granulomas" as tuberculids (e. g. Darier sarcoid or erythema induratum Bazin) according to Abrikossoff.[85] They may become calcified, but this seems to be unusual. Harbitz [86] and others report cases in which these "lipogranulomas" were mistaken for malignant tumors and led to excessive operative procedures, especially when they have appeared at the site of the trauma of a previous operation for removal of a tumor. It is not sufficiently appreciated that when fat tissue is injured the liberated fat may act as a foreign body, especially if crystals of fatty acids or soaps are formed, and then the picture of lipogranulomatosis appears with its proliferation of fibroblasts and foreign body giant cells. The histologic changes of sclerema neonatorum are of this character. The fundamental principles of the reaction of tissues to mixtures of human fat, soaps and cholesterol have been studied by Hirsch.[87]

ATROPHY AND HYPERTROPHY

In those parts of the body where adipose tissue has the function of filling in spaces, a condition known as "serous atrophy of fat" is seen when there has been marked emaciation. This is nothing else than a form of "edema ex vacuo." The fat having been absorbed, the space it formerly occupied is filled with serous fluid, mostly as an interstitial edema, although the cytoplasm of the depleted fat cells apparently also participates in the water storage (fig. 3).

The reverse process often occurs when a solid tissue decreases in size and the place it formerly occupied becomes filled with adipose tissue, constituting essentially a compensatory hypertrophy of fat. The bone marrow is probably the tissue exhibiting this change most frequently, since the marrow of the long bones is seen to fluctuate with every large variation in the demand for blood cells, from yellow fatty marrow composed almost solely of adipose tissue to cellular red marrow, and back again to adipose tissue. Likewise, when bone is absorbed its place is often filled by fatty marrow. In adiposity the excessive fat tissue may crowd out the muscle fibers in the heart wall, especially near the apex. Sometimes the process is so extensive that the fat may extend through to the endocardium. In such cases a weakened heart wall may rupture through the fatty portion, and the fat infiltration may be responsible for slow or sudden cardiac failure, even without rupture.[88] Also the pancreas may have its glandular tissue crowded out by fat tissue, so that little remains but the islets, which seem to be completely spared. Apparently the factor of safety in the pancreas is large, for assimilation of food seems to continue to be excessive in such adipose subjects. When pancreatic

73. Kestner, O.: Virchows Arch. f. path. Anat. **246**: 305, 1923.
74. Rewbridge, A. G.: Fat Necrosis in Bile Peritonitis, Arch. Path. **12**: 70 (July) 1931.
75. Lee, B. J., and Adair, F. E.: Surg., Gynec. & Obst. **34**: 521 (April) 1922.
76. Gottesman, J., and Zemansky, A. P., Jr.: Ann. Surg. **85**: 438 (March) 1927.
77. de Bruin, M.: Nederl. tijdschr. v. geneesk. **1**: 1221 (March 9) 1929. Bernheim-Karrer.[82]
78. McIntosh, J. F.; Waugh, T. R., and Ross, S. G.: Sclerema Neonatorum (Subcutaneous Fat Necrosis), Am. J. Dis. Child. **55**: 112 (Jan.) 1938 (review).
79. Channon, H. J., and Harrison, G. A.: Biochem. J. **20**: 84, 1926.
80. Gray, A. M.: Sclerema Neonatorum, Arch. Dermat. & Syph. **14**: 635 (Dec.) 1926.
81. Harrison, G. A.: Arch. Dis. Childhood **1**: 123 (June) 1926.
82. Bernheim-Karrer, J.: Ztschr. f. Kinderh. **55**: 695, 1933.
83. Siwe, S. A.: Jahrb. f. Kinderh. **141**: 1, 1933; Acta path. et microbiol. Scandinav., suppl. **16**: 438, 1933.
84. Lang, F. J.: Arch. f. klin. Chir. **165**: 450, 1930.
85. Abrikossoff, A.: Verhandl. d. deutsch. path. Gesellsch. **24**: 57, 1929.
86. Harbitz, H. F.: Acta chir. scandinav. **76**: 401, 1935.
87. Hirsch, E. F.: Experimental Tissue Lesions with Mixtures of Human Fat, Soaps and Cholesterol, Arch. Path. **25**: 35 (Jan.) 1938.
88. Saphir, Otto, and Corrigan, M. C.: Fatty Infiltration of the Myocardium, Arch. Int. Med. **58**: 410 (Sept.) 1933. Smith, H. L., and Willius, F. A.: Adiposity of the Heart, ibid. **52**: 911 (Dec.) 1933.

atrophy follows duct obstruction, marked replacement with adipose tissue occurs whether the patient is obese or not.

Replacement adiposity is often seen in those forms of chronic nephritis in which the size of the kidney is reduced, the adipose tissue at the hilus increasing *pari passu*, so that the kidney may appear externally to be of about normal size, despite loss of half or more of its secretory tissue. In pseudohypertrophic muscular atrophy a similar compensatory hypertrophy occurs, the muscles appearing as large as or even larger than normal through replacement of the lost muscle fibers by adipose tissue. Where the adipose tissue comes from in these conditions has not been determined—whether it is new formation from undifferentiated cells, acquisition by fibroblasts of the power to lay on fat or merely an increase in the fat content of the existing local adipose tissues. It is suggested by Wassermann that in the fatty replacement of atrophic muscles, the remaining capillary bed transforms itself with the intramuscular connective tissue into a new adipose tissue.

INSULIN LIPODYSTROPHY

The common use of insulin has produced a pathologic state in adipose tissue which may occur under other conditions but which has hitherto been unrecognized. This is a localized melting away of the fat in the vicinity of the sites of injection, sometimes in areas as large as the palm of the hand, where the panniculus adiposus is entirely absent and the thinned, fatless cutis lies directly on the underlying muscular and fascial structures. The process develops without evidence of inflammation, and as yet no satisfactory explanation has been advanced. Insulin preparations do not contain lipase that might hydrolyze the fat. Nichols [89] suggests that the concentration of insulin causes an active local combustion of carbohydrate, which in turn causes active combustion of the fat. Sometimes areas of hyperplasia of adipose tissue may appear side by side with the atrophic areas; [90] in fact, Priesel and Frey [91] state that local adipose hypertrophy occurs more often than local atrophy.

PANNICULITIS

Under the title "Relapsing Febrile Nodular Nonsuppurative Panniculitis," Christian [92] has described a disease of unknown etiology characterized by recurring attacks of fever, associated with a peculiar generalized nodular inflammation of the subcutaneous tissue, leading in time to areas of atrophy. This condition had been previously described by several others under various titles. Binkley [93] says that of thirteen cases reported in the literature eleven were in females and two in males. The process histologically resembles that seen in various forms of necrosis of fat tissue with inflammatory reaction, such as is seen in traumatic fat necrosis of the breast. Occasionally liquefaction of the fat takes place as in the case reported by Shaffer,[94] the resulting oil discharging externally from the lesions.

SUMMARY

There is now conclusive evidence that adipose tissue is not merely a connective tissue which stores fat but a special organ which has other functions. Therefore it may play a part in disease processes not yet recognized.

Until more is known about the extent and variety of these functions it cannot be known just how much adipose tissue modifies or is modified by various disease processes. But since many of the physiologic functions of tissues have been revealed by their pathologic deviations, the pathologists as well as the physiologists should give more consideration to the possibility of there being hitherto unappreciated activities and maladies of the adipose tissues, which are to be considered as constituting, like the widely distributed bone marrow, one of the largest of the organs of the body. Adipose tissue is not merely a storehouse; it is also a manufacturing plant in active operation, not only producing some or all of its own stored materials but probably conducting other processes not yet revealed to the incurious passers by.

89. Nichols, J. B.: Am. J. M. Sc. **180**: 90 (July) 1930.
90. Dinkler, Georg: München. med. Wchnschr. **85**: 312 (Feb. 21) 1936.
91. Priesel and Frey: Arch. f. Kinderh., supp. 15, 1938.
92. Christian, H. A.: Relapsing Febrile Nodular Nonsuppurative Panniculitis, Arch. Int. Med. **42**: 338 (Sept.) 1928.
93. Binkley, J. S.: Relapsing Febrile Nodular Nonsuppurative Panniculitis, J. A. M. A. **113**: 113 (July 8) 1939.
94. Shaffer, Bertram: Liquefying Nodular Panniculitis, Arch. Dermat. & Syph. **38**: 535 (Oct.) 1938.

ACUTE INVERSION OF THE PUERPERAL UTERUS

A RECORD OF TWENTY-ONE CASES

W. BENSON HARER, M.D.
AND
JOHN A. SHARKEY, M.D.
PHILADELPHIA

Acute inversion of the puerperal uterus, the turning inside out of the uterus, is one of the rarest of obstetric complications. When only a portion of the fundus uteri is inverted, one speaks of the condition as a partial inversion. When the entire organ is inverted, it is called a complete inversion. In the strict sense of the word the latter condition is rare, because there is usually a rim of cervix which does not turn inside out and hence most cases should be classed as partial inversions. From the practical standpoint, however, when the fundus uteri protrudes completely through the cervix the condition is called a complete inversion of the uterus. Such an organ may be lying entirely within the vagina or the inversion may be accompanied by prolapse, in which event the inverted uterus protrudes from the vulvar orifice as a large, soft, bleeding mass of tissue closely resembling a large pedunculated fibromyoma.

Statistics vary widely as to the incidence of this condition. Beckmann [1] states that acute inversion of the puerperal uterus was not encountered in more than 250,000 deliveries at the St. Petersburg Lying-in Hospital. Irving reports an incidence of inversion of the uterus of one in 7,837 cases at the Boston Lying-in Hospital. The cases included in this report consist of fifteen cases of acute inversion of the puerperal uterus occurring in Philadelphia during the years 1931-1938 inclusive, five cases occurring in one hospital outside of Philadelphia during the years 1933-1938 inclusive and one case occurring in Philadelphia prior to 1931. If one considers the frequency of this condition from the standpoint of the five cases occurring in one hospital outside of Philadelphia in a total of 3,700 deliveries, this would give an incidence of one inversion in 740 deliveries. Obviously this is much greater than the incidence of inversion generally encountered throughout the world and is an indication of the fallacy of statistics based on the experience of a single hospital

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1. Beckmann, Wilhelm: Zur Aetiologie der Inversio Uteri postpartum, Ztschr. f. Geburtsh. u. Gynäk. **31**: 371, 1895.

or a small group of physicians. During the eight year period 1931-1938 inclusive there were 243,602 deliveries reported to the registrar of vital statistics in Philadelphia. A brief questionnaire concerning inversion of the uterus was sent to every institution in Philadelphia in which any obstetric patients were treated during this period. We are glad to be able to report that every institution so approached replied to us and we were given free access to the records of all cases of acute inversion of the uterus. Because of the serious nature of this obstetric complication we believe that we may safely assume that all patients with inversion of the uterus occurring in delivery in the home would eventually be sent to a hospital. We therefore believe that we have studied all cases of inversion of the uterus occurring in Philadelphia, a city of more than 2,000,000 people, and in the practices of more than 3,000 physicians during a period of eight years. Fifteen cases in all were so collected. This gives an incidence of one case of acute inversion of the puerperal uterus in 16,240 deliveries. Of our total of twenty-one cases, fourteen occurred in primiparas and seven in multiparas.

Inversion of the uterus may occur spontaneously but is usually due to improper conduct of the third stage of labor. The most frequent cause of inversion of the uterus is suprafundal pressure applied to a relaxed uterus in an effort to expel the placenta. Traction on the umbilical cord before complete separation of the placenta and with the uterus relaxed is also a frequent cause of inversion. Attempts at manual removal of an adherent placenta may bring about an inversion of the uterus in either of two ways: First, the placenta may not be completely detached before the hand is withdrawn from the uterus and the traction on the adherent placenta may initiate the inversion, or, second, the hand and forearm may create a piston-like suction which inverts the uterus. A short umbilical cord or one relatively shortened by being looped about the fetal body may cause traction on the attached placenta and so produce inversion of the uterus immediately following the birth of the child. Various explanations for the spontaneous occurrence of inversion of the uterus have been advanced. Increased intra-abdominal pressure brought about by coughing, sneezing, vomiting or attempts to sit up may produce inversion of the uterus. The theory has been advanced that there is an abnormal distribution of the muscle fibers of the fundal portion of the uterus with a preponderance of circular fibers over the longitudinal ones in some of these cases. It is stated that in those cases in which the placenta is attached to the fundus uteri there is a thinning of this portion of the wall of the uterus and a softening due to the increased vascularity which results in imperfect contraction of the muscle fibers and the production of a "dimple" which predisposes to inversion of the uterus. In other cases there appears to be some abnormality in the innervation of the uterus which results in abnormal contraction of the uterine muscle fibers and the production of "inert" areas or areas of softening in the uterine wall. A personal case of one of us (W. B. H.) in 1936 illustrated this strikingly:

Mrs. C. K., a primipara aged 29, went into labor spontaneously at term. There was marked inertia uteri and it was noticed that the entire left half of the uterus remained soft and flabby during the labor pains. Finally, after thirty hours of such labor without much progress, cesarean section was performed. The uterus was grossly normal, but following the extraction of the fetus only the right half of the uterus contracted and retracted, the left half remaining large and exceedingly flabby. This produced a marked asymmetry of the uterus and actually brought about a dimpling of the fundus exactly like a partial inversion of the uterus. To overcome this obvious tendency to inversion and as a prophylaxis against postpartum hemorrhage, the interior of the uterus was packed with gauze before closure of the uterine incision.

As pointed out by Watson,[2] the law of reciprocal innervation of organs controlled by a sphincter muscle applies to the uterus. In such an organ the innervation is such that there is contraction of the longitudinal muscle fibers and simultaneous relaxation of the circular (sphincter) fibers to bring about emptying of the organ; in the case of the uterus such action, when excessive, may readily produce a spontaneous inversion.

All these causes of inversion of the uterus are illustrated in our twenty-one cases, as shown in table 1. It is readily apparent from this table that sixteen, or 76 per cent, of these twenty-one cases were due to errors in technic and were therefore theoretically avoidable.

The time of occurrence of the inversion with respect to the third stage of labor is of considerable interest and is shown in table 2. In one case the inversion recurred three hours after the manual replacement of the first inversion.

Table 2 shows that 57 per cent of the cases in this series occurred before the placenta was separated from the uterine wall. In an additional 28.5 per cent inversion followed immediately on the expulsion of the placenta and was caused by efforts on the part of the attending physician to express the placenta. Only three cases (14 per cent) occurred one half hour or more after the delivery of the placenta. All three were cases of spontaneous inversion.

The prognosis in acute inversion of the uterus is very bad. Cooke states that there is a mortality of about 40 per cent. In our series of cases there were nine deaths and twelve recoveries, a mortality rate of 43 per cent.

The important signs and symptoms of acute inversion of the puerperal uterus are hemorrhage, shock and the absence of the rounded uterine fundus on abdominal palpation. The hemorrhage may be only moderate in amount but is usually quite profuse, the patient rapidly becoming exsanguinated. When the placenta remains attached to the inverted uterus the amount of bleeding is usually moderate. When the placenta has been detached from the uterine wall either before or after the inversion occurs there is interference with the normal retraction of the uterus and so failure of constriction of the vascular sinuses in the placental area, with consequent serious hemorrhage. In our series hemorrhage was very profuse in twelve, moderately

TABLE 1.—*Causes of Inversion*

	Patients	Per Cent
1. Avoidable	16	76
A. Suprafundal pressure	9	
B. Manual removal	5	
C. Traction on cord	2	
2. Unavoidable	5	24
A. Spontaneous	4	
B. Short cord	1	

2. Watson, B. P.: Personal communication to the authors.

severe in six and only slight in three cases. Shock is almost invariably present in inversion of the uterus and, even when the hemorrhage is very profuse, is out of all proportion to the amount of blood lost. No other obstetric condition is accompanied by such acute and profound shock. The skin becomes cold and clammy; the pulse becomes extremely rapid and so weak as to be imperceptible at the wrist. Within a few minutes after an acute inversion of the uterus a previously normal woman is in an extremely precarious condition. In this group of cases the pulse rate averaged 160 per minute and serious shock was present in twenty cases. One showed no evidence of shock—a most unusual condition in inversion of the uterus.

The differential diagnosis of acute inversion of the uterus is not difficult. Most commonly it is mistaken for a pedunculated submucous fibroid, as was the situation in two of the cases in this series. The absence of the firm rounded mass of the uterus above the symphysis pubis and the presence of hemorrhage and shock should immediately suggest the possibility of an acute inversion of the uterus and the institution of the proper treatment for this condition.

Since more than 75 per cent of all cases of inversion of the uterus are preventable, prophylactic treatment of this condition is of prime importance. The preventive treatment of this rare but serious complication of pregnancy must be started in our medical schools. Medical students must be more adequately instructed in the physiology of the third stage of labor, particularly with respect to the mechanism of the separation and expulsion of the placenta. They must be impressed with the importance of waiting until the placenta has separated before efforts are made to expel it and must be made to understand the danger attendant on pulling on the umbilical cord or on attempting the Credé method of expressing the placenta in the absence of spontaneous, firm uterine contraction. When these fundamentals of obstetric practice become deeply instilled in all physicians and there is consequent improvement in the conduct of the third stage of labor, then indeed will acute inversion of the puerperal uterus become a rare condition.

Such training will require time and is a project for the future. In the meantime one is occasionally faced with the necessity of promptly and properly handling this condition. When, as in the experience of one of us (W. B. H.), this complication occurs in each of two successive deliveries or when, as in the experience of the other of us (J. A. S.), one is called in consultation on five such cases in a relatively short time, this condition assumes colossal proportions and becomes a never to be forgotten catastrophe, and the matter of proper treatment becomes of paramount importance.

At the present time there is considerable divergence of opinion as to the proper treatment of acute inversion of the uterus; Williams,[3] Beck,[4] Titus[5] and Cooke[6] advise immediate replacement of the inverted uterus. Zangemeister[7] reported a 23 per cent mortality in this condition when operation was undertaken in the presence of shock and no mortality when operation was deferred until after reaction had taken place. De Lee[8] originally advocated immediate replacement only to control severe hemorrhage, but in an editorial comment in the Year Book of Obstetrics and Gynecology for 1938 he modified his stand and now advises immediate replacement when it can be readily accomplished. Irving and Kellogg[9] are very emphatic in their belief in deferring replacement of the inverted uterus until after recovery from the shock.

Such divergence of opinions can be explained only on the basis of the personal experiences of these men and the particular type of case that they encountered. Even after many years of active service covering thousands of obstetric cases one sees only few cases of inversion of the uterus. The late Prof. B. C. Hirst saw only eight such cases. We have each had personal experience with five cases of inversion of the uterus, a total of ten different cases, and therefore feel entitled to express our own opinions as to treatment.

We believe that the inverted uterus should be replaced immediately by gentle taxis when the patient is seen shortly after the inversion has occurred. Active antishock treatment should at the same time be started by an assistant and continued until the patient has reacted well. In our cases we have accomplished replacement without much difficulty and, we believe, without adding appreciably to the shock already present. If there is a tendency toward constriction of the cervix, this may be overcome and the replacement of the uterus facilitated by the intramuscular injection of from 0.5 to 1 cc. of solution of epinephrine hydrochloride (1:1,000) as advocated by Urner.[10] In our cases and in those of this series so treated by other physicians the results of immediate manual replacement of the uterus have been very satisfactory. In all these cases improvement was noted immediately after the uterus was replaced. In a total of thirteen cases of immediate replacement of the inverted uterus there were eleven recoveries and two deaths. One death occurred in a case in which inversion complicated eclampsia. The other death occurred as a result of recurrence of the inversion three hours after its first replacement. In this case the attending physician did not arrive at the hospital until more than an hour after the recurrence of the inversion and it was then found to be impossible to replace the uterus.

TABLE 2.—*Time of Occurrence of Inversion*

	Patients	
	Number	Per Cent
1. Before placenta detached	12	57
2. After placenta expelled	9	43
A. Immediately	6	
B. One-half hour later	2	
C. One hour later	1	

Under modern conditions of hospital obstetrics practically all patients are surgically prepared and anesthetized at the time of actual delivery. Since most cases of inversion of the uterus occur during or immediately

3. Williams, J. W.: Obstetrics, New York, D. Appleton-Century Company, Inc., 1926, p. 946.
4. Beck, A. C.: Obstetrical Practice, Baltimore, Williams & Wilkins Company, 1935, p. 573.
5. Titus, Paul: The Management of Obstetric Difficulties, St. Louis, C. V. Mosby Company, 1937, p. 499.
6. Cooke, W. E.: Obstetrics and Gynecology, edited by A. H. Curtis, Philadelphia, W. B. Saunders Company 2: 142, 1933.
7. Zangemeister, W.: Ueber puerperale Uterus-Inversion, Deutsche med. Wchnschr. 39: 729, 1913.
8. De Lee, J. B.: Principles and Practice of Obstetrics, Philadelphia, W. B. Saunders Company, 1925, p. 803.
9. Huntington, J. L.; Irving, F. C., and Kellogg, F. S.: Abdominal Reposition in Acute Inversion of the Puerperal Uterus, Am. J. Obst. & Gynec. 15: 34 (Jan.) 1928.
10. Urner, J. A.: The Use of Adrenalin in the Treatment of Acute Inversion of the Puerperal Uterus, Am. J. Obst. & Gynec. 25: 131 (Jan.) 1933.

after the third stage of labor, these patients are under perfect conditions for the immediate replacement of the uterus. Many will not even require additional anesthesia. A change of gloves is probably all that is needed on the part of the attending physician. The inverted uterus is usually quite soft and relaxed at this time, so that replacement can be effected easily and quickly. The whole procedure can be accomplished before serious shock develops or much blood is lost. It must be emphasized that replacement must be effected immediately to insure good results.

If the attending physician is not competent to replace an inverted uterus and a consultant must be called, considerable time may elapse before his arrival. In such cases he is likely to find the patient in profound shock and greatly exsanguinated. On examination of such a patient the cervix is found to be so constricted as to make replacement of the uterus extremely difficult or impossible. Obviously such a patient is an extremely poor risk for any operative procedure and so one's efforts should be directed toward the control of bleeding and the combating of shock. The hemorrhage may be minimized by pushing the inverted uterus up into the vagina and packing around it with sterile gauze. Intravenous dextrose or acacia followed as soon as possible by blood transfusion, the application of external heat and the administration of morphine sulfate and cardiac stimulants may be sufficient to overcome the shock. The situation, however, is always desperate. In one of the cases in this series in which no attempt was made to replace the inverted uterus but in which all other treatment, including blood transfusion, was used, the patient died in three hours. In another case after moderate but unsuccessful effort at replacement of the inverted uterus death occurred within two and three-quarters hours. These patients were all in deep shock and markedly exsanguinated. In three cases of intermediate replacement the uteri were replaced with great difficulty and all three patients died. In another case the uterus was replaced manually after an interval of eleven hours during which time active anti-shock treatment was carried out. In this case death occurred six hours after replacement of the uterus. Kellogg speaks of cases of inversion of the uterus in which constriction of the cervix has occurred as a subacute inversion. In many such cases, and in all cases of chronic inversion of the uterus, manual replacement is impossible. In such cases treatment must be effected by surgical means. Replacement of the uterus in these cases may be effected vaginally by Küstner's[11] operation or by the better known Spinelli[12] modification. In this operation the constricting ring of cervix is incised in the midline anteriorly. The uterus is reinverted and the uterine incision then repaired as in an anterior vaginal hysterotomy. Huntington advocates the abdominal approach for reinversion of the uterus. In his method the abdomen is opened by a midline incision below the umbilicus. The uterus is then replaced by grasping the invaginated portion with strong vulsellum forceps on opposite sides of the rim and pulling it up in a hand over hand fashion. After complete replacement of the uterus it is packed vaginally.

Table 3.—*Treatment and Results*

Replacement	Number	Recovered	Died	Interval Between Replacement and Death
1. Manual	16	11	7	
A. Immediate	13	11	2	2 hrs., 7½ hrs.
B. Intermediate	3	0	3	¾ hr., 1½ hrs., 1¾ hrs.
C. Delayed	1 (11 hrs.)	0	1	6 hrs.
D. Unsuccessful.	1	0	1	2 hrs.
2. Surgical	2	1	1	
A. Huntington's method	1	0	1	2 hrs.
B. Supravaginal hysterectomy	1	1	0	
3. No attempt	1	0	1	3 hrs.

Two of these patients were treated by operative means. In one case a laparotomy under ethylene anesthesia was done five hours after inversion and the uterus replaced by the method of Huntington. The patient died two hours later. In the other case the condition was diagnosed as a pedunculated fibroid and a laparotomy was done for hysterectomy. When the peritoneal cavity was opened it was found that the uterus, which had actually been inverted, had been replaced in the process of packing the vagina prior to operation. Hysterectomy was done and on examination of the excised uterus no fibroid was found. This patient recovered.

The effect of inversion of the uterus on subsequent pregnancy and labor is interesting. Not many such cases have been reported. In several such cases, as for example the one reported by Fox,[13] the uterus inverted again at the time of a subsequent delivery. In other cases subsequent delivery has been uneventful. Cesarean section is indicated in subsequent pregnancies in those cases in which inversion was treated by a surgical procedure such as Küstner's, Spinelli's or Haultain's operation. One of the patients in this series has been delivered recently without any abnormality.

CONCLUSIONS

Seventy-six per cent of the cases in this series were due to errors in technic and therefore were theoretically avoidable.

Immediate manual replacement of the inverted uterus together with active anti-shock treatment gave the best results. Intermediate and delayed manual replacement and surgical replacement results in a high mortality.

1600 Walnut Street.

11. Küstner, Otto: Methode konservative Behandlung der inverturierter Inversio Uteri puerperalis, Zentralbl. f. Gynäk. **17**: 945, 1893.

12. Spinelli, P. G.: Della inversione uterina, Riv. di. ginec. contemp., Napoli **1**: 1, 1897.

13. Fox, P. C.: Acute Inversion of Puerperal Uterus in Two Successive Pregnancies, Am. J. Obst. & Gynec. **30**: 295 (Aug.) 1935.

The Span of Life Has Not Been Lengthened.—In the common way of thinking longevity really means living past 80 years, and great human longevity means being a nonagenarian or centenarian. Progress in medicine and improvement in the public health have done little or nothing about enabling the individual to achieve such a goal, as the cold statistical facts about the order of human dying make abundantly clear. The span of human life has not been lengthened, and there is no present prospect that it soon will be. The average duration of life is all that has been altered, and that has been accomplished chiefly by giving more babies a fairer start in life's journey than they use to have. Because more of them get by the early and very difficult hurdles, absolutely more of them survive at later ages. But the terms of the bet that any individual man aged 70 today can safely lay that he will be alive at 90 appear to be not quite as good as they were fifty years ago.—Pearl, Raymond: The Search for Longevity, in Landmarks of Medicine, New York, D. Appleton-Century Company, 1939.

EXPERIMENTAL HIBERNATION OF METASTATIC GROWTHS

PRELIMINARY REPORT

ARKELL M. VAUGHN, M.D.
Associate Clinical Professor of Surgery, Loyola University School of Medicine
CHICAGO

In recent months there has been considerable publicity concerning hibernation or "freezing" in cancer cases. To ascertain the practicability of the method I undertook observations on six cases of hopeless metastatic cancer after visiting the clinic of Dr. Fay and Dr. Smith in Philadelphia and noting the methods they employed in their original observations on the effects of cold in cases of human cancer. In these six cases every known type of treatment had been given without results. It was my aim to observe whether or not hibernation would retard the cancerous process or alleviate the pain.

Fay [1] in 1936 first made repeated microscopic studies on the effect of reduced local temperatures on carcinomatous growths, and to him due credit must be given. He presented clinical, pathologic and biologic evidence that temperature plays one of the most important roles in the activation of embryonic cell growth.

In this article, hibernation as defined by Smith and Fay means a general reduction of body temperature below the critical level of 95 F., and refrigeration means the local application of cold by means of ice water circulated through a specially constructed apparatus designed to fit the structures of the cooling process.

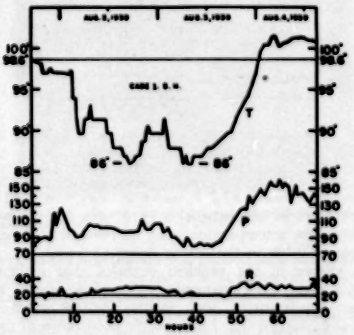

Fig. 1 (case 1).—Temperature, pulse and respirations during forty-three and one half hours of hibernation. Note the increase in pulse rate as the temperature returns to normal. Also the slight variations in the respiration.

The sequence of events leading up to this research is as follows:

1. Fay [1] studied the body surface temperature of various parts of the body, based on a neurologic dermatomere plan. He noted that temperatures in the extremities might fall from 12 to 22 degrees below the normal for the mouth, while the temperature of the breast, lying in the fifth thoracic segment, was extremely variable and showed an increase in temperature from 0.5 to 3 degrees above the temperature of segments lying within 2 inches on each side.

2. Malignant and metastatic bone tumors of the hands and feet are extremely rare, as has been shown by Coley and Higinbotham.[2] Mason [3] noted that carcinomas of the hands and feet are equally rare and are of low grade malignancy. Pack and Adair [4] brought

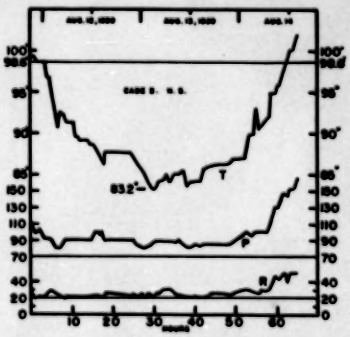

Fig. 2 (case 2).—Temperature, pulse and respirations during fifty-four and one half hours of hibernation. Note the rectal temperature of 83.2 F., the lowest temperature reached in this series of cases.

out the fact that melanoma is the only form of tumor occurring with any considerable frequency on the hands or feet. Geschickter and Copeland [5] emphasized the comparative infrequency with which skeletal or bone metastases involve the extremities, while skeletal metastases occur more frequently in the pelvis, upper part of the femur, ribs, spine and skull, where there is a more abundant blood supply with resultant higher temperature than in the extremities.

3. The work of Huggins and Noonan [6] demonstrated that red bone marrow present in the tail segments and metatarsal bones of newborn rats normally disappeared from the tail and the extremities in approximately two weeks, if the animals were exposed to environmental temperatures. If, however, the distal half of the rat's tail was implanted into the abdomen or back or the feet were amputated and placed in the abdominal cavity, red bone marrow persisted during the long period of observation. The portion of the tail exposed to environmental temperatures, however, showed the replacement of red bone marrow by yellow bone marrow, and it was concluded that the favorable temperature of the body was responsible for the retention of activity of the red bone marrow. This shows that heat or warmth is necessary for normal cell growth and mitosis. Conversely, since carcinoma is thought to be an excessive

From the Department of Surgery, Mercy Hospital-Loyola University Clinics.

The sisters, staff, residents, interns and nurses of Mercy Hospital and Dr. Maud Slye, of the University of Chicago, cooperated in making this experimental work possible.

1. Fay, Temple, and Henry, G. C.: Correlation of Body Segmental Temperature and Its Relation to the Location of Carcinomatous Metastasis: Clinical Observations and Response to Methods of Refrigeration, Surg., Gynec. & Obst. 66:312 (Feb.) 1938.

2. Coley, B. L., and Higinbotham, N. L.: Tumors Primary in the Bones of the Hands and Feet, Surgery 5:112 (Jan.) 1939.

3. Mason, M. L.: Carcinoma of the Hands and Feet, Surgery 5:27 (Jan.) 1939.

4. Pack, G. T., and Adair, F. E.: Subungual Melanoma, Surgery 5:47 (Jan.) 1939; Symposium on Tumors of the Hands and Feet: Introduction, ibid. 5:1 (Jan.) 1939.

5. Geschickter, C. F., and Copeland, M. M.: Tumors of Bone, revised edition, New York, American Journal of Cancer, 1936, p. 494.

6. Huggins, C. B., and Noonan, W. J.: An Increase in Reticulo-Endothelial Cells in Outlying Bone Marrow Consequent upon a Local Increase in Temperature, J. Exper. Med. 64:275 (Aug.) 1936.

or wild growth of cell tissue, cold in the form of hibernation or refrigeration should tend to decrease this growth, diminishing the blood supply to this outlaw tissue.

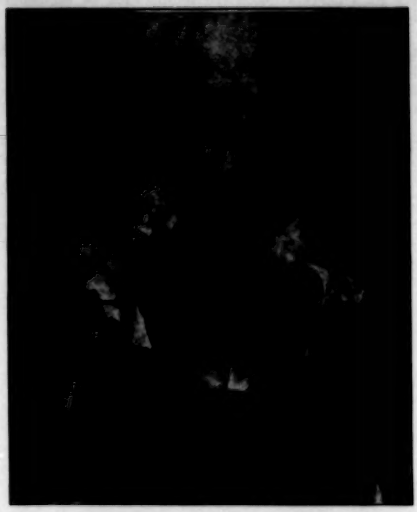

Fig. 3 (case 2).—Appearance of the pelvis and upper parts of the femurs, showing extensive metastases.

4. Smith [7] has shown that varying the temperatures during incubation and growth periods of chick embryos is invariably followed by some alteration from normal, in retarding development, in producing malformations

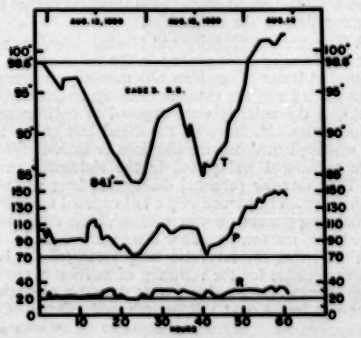

Fig. 4 (case 3).—Temperature, pulse and respirations during forty hours of hiberation. The patient reacted unfavorably.

and actual monsters or in disintegrating the embryonic tissue early in its effort to differentiate. There is a narrow range which might be spoken of as the optimal zone in which normal growth, differentiation and organization of the tissues take place with the development of normal chicks. This range is between 97 and 104 F., although with either the upper or the lower level there will be an appreciable diminution in the number of viable chicks. Above 105 F. the temperature is too great for the successful growth and differentiation of embryonic tissue. At the lower level there is a critical temperature lying at approximately 95 F. at which there will be marked retardation in the development of the embryo and a viable chick will only rarely develop; if the chick does develop, there will be marked deformity.

Fay and Smith point out that regressive cell changes have been noted where local temperatures of from 40 to 50 F. have been employed constantly for from ten to twenty-eight days. Observations on general reduction in body temperature to below 90 F. have been carried out in the hope that deep metastatic lesions might be unfavorably influenced in their growth response to subcritical temperature, if these could be maintained for extended periods of time. In our hibernation we used

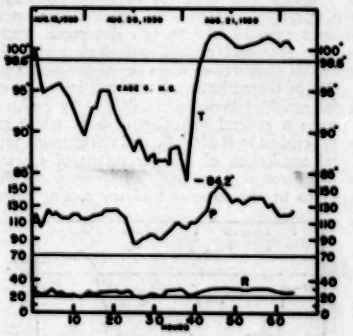

Fig. 5 (case 4).—Temperature, pulse and respirations during thirty-one and one half hours of hiberation.

the temperature 95 F. as the upper level, the lowest temperature being 83.2 F. rectally. Fay [8] reduced the temperature of one patient to 74 F. No one knows as yet how low a temperature may be reduced to be compatible with life in the human being.

A survey of the problem revealed that malignant tumors occur most frequently in areas associated with higher temperatures, such as the uterus, breast and gastrointestinal tract. Likewise the occurrence of metastatic carcinomatous lesions is usually in areas with higher temperatures, as the lungs, liver and brain, as well as the central, better vascularized areas of the skeleton, as the pelvis, upper part of the femur and spine. In other words, carcinoma thrives best in organs which contain an abundant blood supply and are warmer than certain other parts of the body, such as the extremities.

The aim of these experiments, therefore, was to reduce body temperature below the critical level of 95 F., which would produce a vasoconstriction of the blood vessels and cause less blood to flow through the cancerous organ. In this way I hoped to retard the growth of the cancerous lesion, for the time being at

7. Smith, L. W., and Fay, Temple: Temperature Factors in Cancer and Embryonal Cell Growths, J. A. M. A. 113:653 (Aug. 19) 1939.

8. Fay, Temple: Personal communication to the author.

least. Up to the present time six hibernations have been performed in six cases. No deaths have occurred during the hibernation. Two of the six patients are alive and fairly comfortable seven and eight months after treatment. Several referred patients were refused hibernation because they were in the terminal stages with only a few hours' life expectancy. All our cases were hopeless. Each patient had received all the known orthodox treatments, such as high voltage roentgen therapy, radium, lead and calcium. A ray of hope was offered to them by hibernation, by which they sought to obtain relief.

PROCEDURE

A specially equipped air conditioned room was provided at Mercy Hospital in which a room temperature of 60 F. was maintained as closely as possible. Several

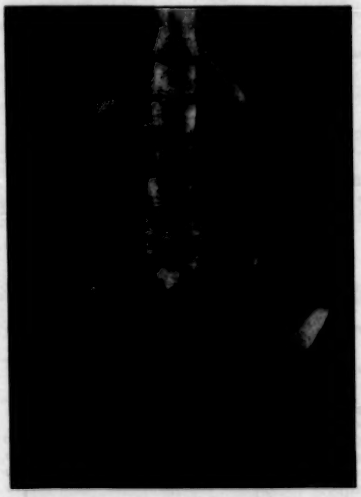

Fig. 6 (case 4).—Appearance of pelvis and upper femurs before hibernation, showing metastases (Aug. 21, 1939).

hours before hibernation was started sedation was given by mouth or rectum in the form of pentobarbital sodium, phenobarbital, paraldehyde, bromides or choral hydrate. Avertin with amylene hydrate was given rectally in the first three cases, while intravenous evipal soluble was given in the last three. Paraldehyde was introduced into the stomach through a nasal catheter in order to keep the patient quiet while the temperature was being lowered (Fay-McCravey technic). When the temperature reached 90 F. or less, little or no sedative was given, as the patients lay quietly in this state; they moved occasionally, could be aroused but soon returned to slumber, answered questions in a logical manner and even recognized members of the family. One patient was placed on a bed pan and had a voluntary micturition with the temperature at 86 F. The patients remember nothing from the time the anesthesia is administered until they come out of the hibernation. One patient, on arousing from the hibernation, asked when she was to get the "freezing treatment." The patients do not remember the shivering stage, although they may complain at the time of feeling cold. A considerable amount of paraldehyde was given throughout the entire course of treatment in the earlier cases

Fig. 7 (case 4).—Appearance of the pelvis and upper parts of the femurs one month after hibernation. Note pathologic fracture of the right femur (Oct. 10, 1939).

Fig. 8 (case 4).—Appearance of the pelvis and upper parts of femurs three months after hibernation. Note the rapid extension of the metastases, especially in the right ilium and femur. A plaster of paris cast of the leg and pelvis had been applied six weeks previously. The cast was removed, the roentgenogram taken and a new cast applied at this time (Dec. 19, 1939).

because it was feared that the patients would have a dreadful remembrance of the cold, but Fay's observations [5] led me to use but little sedation after the temperature was down.

The procedure of hibernation is a very precarious one and should not be undertaken without adequate preparation and thought. The patient's family should be informed that death may occur at any time during

Fig. 9 (case 4).—Appearance of the pelvis and upper parts of the femurs five months after hibernation with a plaster of paris cast. Note the metastatic extension and the pathologic fracture (Feb. 2, 1940). (Serial roentgenograms of patient 1 reveal similar progressive metastatic extension.)

hibernation. Patient 6 in my series, with a temperature of 87 F., suddenly stopped breathing and the heart stopped; it was only by heroic measures instituted by the intern in attendance that vital functions were

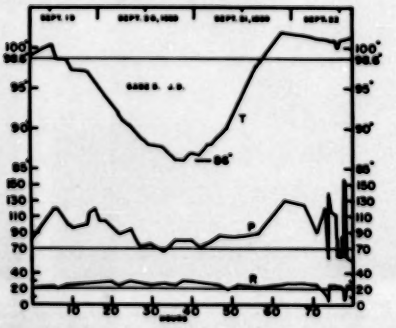

Fig. 10 (case 5).—Temperature, pulse and respirations during thirty-six and one half hours of hibernation.

resumed. We lost no patients during the hibernation, but it required constant attention by either a resident, an intern or myself, as well as the help of a graduate nurse and the floor nurses.

The nursing care is very exacting. Rectal temperatures, pulse and respirations are taken and charted at half hour intervals; almost constant blood pressure readings must be taken. Sometimes six special nurses are required in twenty-four hours, and the expense incurred for this service is great and in some instances almost prohibitive.

TABLE 1.—*Basal Metabolic Rates*

Case	Basal Metabolic Rate Before Hibernation	Basal Metabolic Rate During Hibernation	Comment
1. S. H.	− 9%	−32%; temperature 98.1 F.	Basal metabolic rate taken after 35 hours of temperature under 95 F.; after hibernation basal rate −9%
2. N. S.	+45%	−30%; temperature 84.2 F.	Basal metabolic rate taken after 38 hours of temperature under 95 F.
3. R. C.	− 7%	−37%; temperature 86.4 F.	Basal metabolic rate taken after 29 hours of temperature under 95 F.
4. H. G.	+ 7%	−4%; temperature +86.2 F.	Basal metabolic rate taken after 29 hours of temperature under 95 F.
5. J. D.	+30%	+28%; temperature 87.4 F.	Basal metabolic rate taken after 15 hours of temperature under 95 F.
6. D. G.	Not determined	Not determined	

The pulse and respirations usually run a smooth and even curve, as shown by the accompanying graphs, until the end of the hibernation, when the temperature

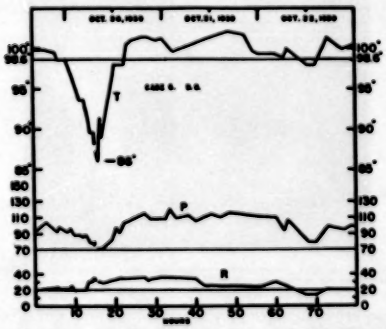

Fig. 11 (case 6).—Temperature, pulse and respirations during nine and one half hours of hibernation. Note the gap in the graph where the pulse and respirations ceased. Heroic resuscitation methods revived the patient. He was allowed to come out of hibernation for fear of death during treatment. His symptoms were not relieved and he died at home three weeks after hibernation, apparently from cachexia. Consent for necropsy was not obtained. This illustrates the dangers associated with this treatment.

is allowed to return to normal. Invariably the pulse rate then becomes very fast, sometimes reaching 160 to 180. This is the most dangerous time of the whole procedure and is the time when death is most likely to occur from peripheral vascular circulatory failure.

COMMENT

Little clinical research has been done on human beings with a temperature below 95 F. from the standpoint of physiology or physiologic chemistry. For that reason I undertook to make a few superficial observations. In all cases except the last the basal metabolic rate

was determined before and during hibernation, an attempt being made to determine the rate at the lowest possible temperature. The results of these tests are listed in table 1.

In case 2, with a rectal temperature of 84.2 F., the basal metabolic rate was — 36 per cent, while before hibernation it was + 45 per cent.

Blood chemistry determinations were made in most cases before and during hibernation and in some after recovery from the hibernation, as may be seen in table 2. An interesting observation was that the blood sugar was high while the nonprotein nitrogen and urea were decreased in the majority of cases.

TABLE 2.—*Blood Chemistry Determinations*

Case	Time Relative to Hibernation	Temperature, F.	Date	Nonprotein Nitrogen	Urea Nitrogen	Sugar	Chlorides	Creatinine
1. S. H.	Before	.....						
	During	86.9 rectal	8/ 2/39	17.9	8.3	153	...	....
	After	.....	8/26/39	28.5	10.5	82	...	....
2. N. S.	Before	.....	8/11/39	32.0	14.0	115	440	....
	During	84 rectal	8/13/39	18.0	8.2	151	...	....
	After	.....	8/16/39	18.2	9.0	125	350	....
3. R. C.	Before	.....	8/11/39	36.0	15.0	110	420	....
	During	98.5	8/13/39	17.0	8.2	130	...	....
	After	102.2 rectal	8/16/39	17.8	8.0	140	440	....
4. H. G.	Before	.....	9/16/39	34.0	12.0	160	410	....
	During	98 rectal	9/20/39	16.8	8.0	210	420	....
	After	100.3	9/22/39	19.0	8.9	90	420	....
5. J. D.	Before	.....	9/ 2/39	82.0	56.0	80	480.4	6.1
	During	97.6 rectal	9/20/39	20.2	9.1	180	410	....
	After	.....	9/21/39	24.0	10.0	100	412	....
6. D. G.	Before	.....	10/ 7/39	28.8	10.2	78	...	1.51
	During	97 rectal	10/20/39	45.0	0	180	470	....
	After	.....						

The hemoglobin and red blood cells were increased, as would be expected, as the result of dehydration. The reticulocytes were increased during the hibernation period. The results of blood counts on these patients before, during and after hibernation are shown in table 3. Sedimentation readings were taken in some cases with greatly reduced temperature, and these are also shown. Electrocardiographic studies were made in some cases. Blood pressure readings were generally low and in some instances the systolic pressure reached as low as 70.

The bowels did not function in any of the cases during hibernation. Catheterized specimens of urine were obtained every twelve hours. The amount of urine obtained gradually decreased every twelve hours unless fluids were given. The temperature of the urine was usually from 1 to 5 degrees lower than the rectal temperature, which was an interesting observation.

The illustrations show pulse, respiration and temperature charts of the six patients hibernated and roentgenographic appearances of two of these patients.

REPORT OF CASES

CASE 1.—S. H., a woman aged 52, had metastatic carcinoma of the bones from primary carcinoma of the breast. She is living eight months after treatment, with great relief of pain; no narcotics have been necessary. However, she had high voltage roentgen therapy before and snake venom after hibernation.

CASE 2.—N. S., a woman aged 38, had metastatic carcinoma of the bones from primary carcinoma of the breast which was removed by radical mastectomy four years previously. She died three days after hibernation, probably from peripheral cardiovascular collapse, since autopsy revealed no apparent cause of death. Pneumonia was not a cause of death in this or any of the cases in which autopsy was done.

CASE 3.—R. C., a woman aged 32, had metastatic carcinoma of the bones from primary carcinoma of the breast. She reacted unfavorably while undergoing treatment, as noted. She died seven days after hibernation; permission for necropsy was not obtained. She was generally debilitated and her life expectancy was short before treatment.

CASE 4.—H. G., a woman aged 26, had metastatic carcinoma of the bones from primary carcinoma of the breast, which was removed by radical breast amputation two years previously. She is living seven months after treatment; pain was relieved for the first three months in spite of pathologic fracture of the femur. She suffers from pain now, requiring codeine by mouth occasionally. She had some high voltage roentgen therapy before hibernation.

CASE 5.—J. D., a woman aged 30, had primary carcinoma of the cervix, grade 3, with generalized carcinomatosis. She died twenty-four hours after completion of hibernation. Necropsy revealed cerebral edema as the cause of death. The pathologic changes in kidneys and ureters secondary to carcinoma of the cervix could easily have been responsible for the cerebral edema.

CASE 6.—D. G., a man aged 32, had primary carcinoma of the sigmoid colon with generalized carcinomatosis; a colostomy was done in February 1939 (fig. 11).

TABLE 3.—*Blood Counts*

Case	Temperature	Time Relative to Hibernation	Date	Erythrocytes	Hemoglobin	Leukocytes	Sedimentation Rate	Reticulocytes
1. S. H.	.....	Before	7/ 3/39	5,770,000	10.5 Gm.; 68.2%	4,350		
		During	8/ 1/39					
		After	9/ 7/39	5,850,000	Same	6,300		
			9/ 3/39	5,700,000	12.9 Gm.; 70%	6,400	20 min. in 1 hr.; Cutler method normal in 10 min.	5.98%
2. N. S.	.....	Before	8/11/39	2,860,000	8 Gm.; 40% Sahli	7,600	.....	6.0%
		During	8/13/39	4,000,000	10 Gm.; 50% Sahli	12,400	.....	22.0%
		After	8/16/39	2,500,000	9 Gm.; 52% Sahli	10,000		
3. R. C.	.....	Before	8/11/39	4,100,000	10 Gm.; 64.9%	8,400	.....	0.3%
	98.6 F. rectal	During	8/13/39	4,300,000	12 Gm.; 70%	5,300	.....	10.0%
	102.2 F. rectal	After	8/16/39	2,980,000	7.5 Gm.; 49%	9,000	14 min. in 1 hr.; Cutler method normal in 8-10 min.	
4. H. G.	.....	Before	9/14/39	3,880,000	11.5 Gm.; 74.7%	6,200		
	98.2 F.	During	9/20/39	4,000,000	10 Gm.; 58%	16,000	.....	5.0%
	100.3 F.	After	9/21/39	3,300,000	10 Gm.; 58%	7,500	.....	1.2%
5. J. D.	.....	Before	9/14/39	4,000,000	11 Gm.; 64%	7,600	.....	0.08%
	97.6 F.	During	9/20/39	3,600,000	11 Gm.; 64%	.....	.....	4.0%
	98.6 F.	After	9/21/39	4,000,000	9 Gm.; 52%	.....	.....	0.2%
6. D. G.	.....	Before	10/18/39	2,880,000	8.5 Gm.; 55.1%	14,200	.....	4.0%
		During						
		After						

SUMMARY

1. Six patients with hopeless metastatic carcinoma, ranging in age from 26 to 52 years, have been hibernated.

2. The lowest temperature obtained was 83.2 F. rectal.

3. The hours spent in hibernation ranged from nine and a half to fifty-four and a half. The serious condition of the patient accounted for the shortness of the nine and a half hour hibernation.

4. Basal metabolic rates were determined at the submerged temperature, the lowest being 84.2 F. rectal; the metabolism was lowered in every case in which the determination was made.

5. Primary carcinoma of the breast with metastases in the bones was the diagnosis in four of the six cases; generalized carcinomatosis of the abdomen from primary carcinoma of the cervix and sigmoid colon accounted for the other two.

6. No deaths occurred during hibernation; four patients died between twenty-four hours and three weeks after hibernation.

TABLE 4.—*Summary of Cases of Hibernation*

Case	Sex	Age	Diagnosis	Hours Under 96 F.	Results
1. S. H.	♀	32	Metastatic carcinoma of bones; primary carcinoma of breast; breast not removed	43½	Marked relief for 2 months; living 8 months; metastases progressing
2. N. S.	♀	38	Metastatic carcinoma of bones; primary carcinoma of breast; breast removed 4 years previously, radical operation	54½	Death 3 days later
3. R. C.	♀	32	Metastatic carcinoma of bones; primary carcinoma of breast; breast not removed	40	Death 7 days later
4. H. G.	♀	26	Metastatic carcinoma of bones; primary carcinoma of breast; removal of breast 2 years previously	31½	Relief of pain for 3 months; living 7 months; metastases progressing
5. J. D.	♀	30	Primary carcinoma of cervix, grade 3, 6 months' duration; generalized, carcinomatosis	36½	Death in 24 hours from cerebral edema
6. D. G.	♂	32	Primary carcinoma of sigmoid; generalized carcinomatosis	9½	No relief; death in 3 weeks

7. Two patients are still living seven and eight months respectively after hibernation; they were entirely free from pain for three months and at present no narcotics are necessary to relieve their discomfort.

8. Roentgenographic studies reveal that the metastatic bone lesions are gradually progressing (figs. 6, 7, 8 and 9).

9. High voltage roentgen therapy had been given to all patients before hibernation.

10. Necropsy was performed on two of the four who died; cerebral edema accounted for one death, but nothing tangible could be found to account for the second death. Pneumonia was not a cause of death in any case.

CONCLUSIONS

A state of subcritical temperature was induced in six cases and certain physiologic changes were observed.

The relief of pain was the only result of possible value found in the two patients still living; but it should be noted that these patients had had high voltage roentgen therapy preceding hibernation which might in some degree be responsible for the relief of pain.

X-ray evidence reveals that one hibernation has not retarded the metastatic skeletal growth of carcinoma in these cases.

In my opinion this procedure is hazardous and is not justifiable in the treatment of hopeless metastatic carcinoma.

Animal experimentations in this field might be of value as a preliminary to any future use of hibernation therapy for human cancer.

1180 East Sixty-Third Street.

Clinical Notes, Suggestions and New Instruments

CARDIAC MANIFESTATIONS FOLLOWING ERGOTAMINE TARTRATE THERAPY FOR MIGRAINE

J. BAILEY CARTER, M.D., CHICAGO

Since the isolation of ergotamine tartrate by Stoll [1] in 1918, enormous quantities have been used clinically. All available reports, analyzed by von Storch [2] for untoward effects of ergotamine tartrate therapy, revealed only forty-two serious sequelae, including eight fatal cases. Twenty-three occurred in obstetric cases, eleven in thyrotoxicosis and eight in miscellaneous disorders. This review also revealed that overdosage, and/or associated sepsis, obliterative vascular disease and/or cardiovascular disease play an important role in the production of ill effects. Death occurred in only one case [3] unassociated with any of these factors.

Cardiovascular disease as a contributing factor is emphasized by Zimmermann,[4] who reported that a patient having anginal attacks was given one 0.5 mg. dose subcutaneously and died an anginal death. Labbé [5] gave a patient with organic heart disease a 0.5 mg. dose subcutaneously, daily for three days, with angina three hours after each dose and hemiplegia three days after the last dose. In a similar case, one 0.5 mg. dose given subcutaneously was followed by "syncopal" death.[6]

Although overdosage appears responsible for most of the ill effects of ergotamine tartrate therapy, doses of 3 mg. daily for twenty-eight days [7] and a daily 0.5 mg. injection for over eighteen months [8] have been used without apparent harm.

The first definite laboratory demonstration of the stimulant effect of ergot on the peripheral arteries was given by Kobert.[9] Histologic changes of ergotism, reported by von Recklinghausen [10] and confirmed by Lewis,[11] have been observed by Yater and Cahill [12] and Gould, Price and Ginsberg [13] to follow the use of ergotamine tartrate.

Pathologically, the changes associated with ergotamine tartrate poisoning are vasospastic obliteration of the arteries,

From the Department of Medicine, Rush Medical College of the University of Chicago.

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2. von Storch, T. J. C.: Complications Following the Use of Ergotamine Tartrate: Their Relation to the Treatment of Migraine Headache, J. A. M. A. **111**: 293 (July 23) 1938.

3. Hochne: Klinische Erfahrungen mit den modernen Wehenmitteln insbesondere mit Gynergen, Arch. f. Gynäk. **125**: 356, 1925.

4. Zimmermann, Oskar: Störung der Coronardurchblutung durch Ergotamin, Klin. Wchnschr. **14**: 500 (April 6) 1935.

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11. Lewis, Thomas: The Manner in Which Necrosis Arises in the Fowl's Comb Under Ergot Poisoning, Clin. Sc. **2**: 43 (Sept.) 1935.

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13. Gould, S. E.; Price, A. E., and Ginsberg, H. I.: Gangrene and Death Following Ergotamine Tartrate (Gynergen) Therapy, J. A. M. A. **106**: 1631 (May 9) 1936.

intimal edema and hyperplasia, hyaline degeneration and thickening of the vascular walls, lymphocytic infiltration and frequent thromboses.

Significant symptoms suggestive of ergotism are those of (1) vascular occlusion, i. e., peripheral pain or paresthesias, coldness, cyanosis or blanching of the extremities, and (2) coronary occlusion, i. e., precordial pain or oppression and pain or paresthesia of the arm. Recurrence or persistence of these symptoms necessitates immediate search for organic pathologic change.

Ergotamine tartrate for the relief of migraine was first reported by Maier [14] in 1926. Although the drug has no prophylactic value,[15] it is the most effective [16] specific [17] treatment known for migraine. Results in recurrent attacks are just as dramatic and conclusive as when the drug is first used.[18] It has given prompt relief of attacks in 90 per cent of more than 300 cases.[19] Its use as an effective means of aborting or terminating migraine headaches has greatly increased. No ill effects from the use of ergotamine tartrate in migraine have been reported. The following report should therefore be of interest:

REPORT OF CASE

Mrs. R., aged 36, married fifteen years and five years a widow, contracted headache about 4 p. m. March 26, 1938. A physician gave a hypodermic of unknown content, without relief. At 1 a. m. March 27 0.5 mg. of ergotamine tartrate was given intramuscularly, and immediately palpitation, tachycardia, severe substernal distress and precordial pain with tightness in the throat developed, the headache being unrelieved. Thirty minutes later, one-third grain (0.02 Gm.) of pantopon was given hypodermically without relief. At 4 a. m. all complaints persisted in their original intensity. Auricular fibrillation was present with a ventricular rate of about 120 per minute. Administration of pantopon one-third grain was repeated hypodermically. At 6 a. m. the heart suddenly reverted to normal sinus mechanism. On disappearance of palpitation the patient slept between three and four hours. At 10 a. m. the precordial distress was less but moderately severe. The pulse rate was 72 and the rhythm regular. The heart borders were within normal limits by percussion. No murmur, no thrill and no other significant change were noted. An electrocardiogram made at 7 p. m. March 27 revealed nothing remarkable, and another record April 4 revealed, by comparison, no variation of significance. She has had no further trouble with her heart. A similar injection, one month previously, had resulted in substernal oppression without relieving the headache. The patient, 5 feet 2 inches (157 cm.) tall and weighing 102 pounds (46 Kg.), of feminine habitus, anxious and neurotic and with evidence of vasomotor instability, had measles, chickenpox and scarlet fever during childhood, typhoid in 1915, a tonsillectomy in 1916 and influenza in 1918. She has had recurrent headaches repeatedly diagnosed as migraine (?) since 1927, and hay fever from 1929, which was completely relieved by injections over a period of three summers. Appendectomy was done in 1930. Since 1935 sinusitis has complicated the symptomatology, confused the diagnosis and interfered with the therapeutic results of the headache. Owing to the dyspnea of allergic asthma associated with the hay fever in 1929, and preoperatively in 1930, the patient had submitted repeatedly to dental, ophthalmologic, gastrointestinal and extensive cardiovascular examination by various physicians, including several cardiologists, without significant observations.

For eight years the headaches occurred every two or three weeks. Since 1935 they have occurred daily. Chiefly frontal, they also involved the temporal regions, rarely alternating and never generalized. Blurring of vision just before and near the end of an attack (at the height of the pain) occurred, but not constantly. Severe pain in the left eye occurred frequently. Lacrimation has been more constant. Nausea has been constant, the attack clearing up after the vomiting of bile. She insists that the only variation in the headaches since the onset of sinusitis in 1935 has been their frequency with daily occurrence. She also states that if she becomes nervous or excited or worried, especially when tired, she can develop, within half an hour, a headache indistinguishable from that described, all the characteristics being present even to nausea and vomiting with relief. No history of recurrent headaches, epilepsy, mental disease or allergy in the parents or grandparents was elicited.

COMMENT

Failure of relief by ergotamine tartrate is against a diagnosis of migraine.[17] "The physiologic effects of a subcutaneous injection of ergotamine tartrate do not occur until ten minutes or more after injection—never immediately. Psychogenic reactions do. Ergotamine causes bradycardia by ten to twenty beats, rarely tachycardia. All these symptoms are those of acute anxiety—excepting auricular fibrillation." [20]

Although the diagnosis of migraine appears doubtful and other possible etiologic factors cannot be eliminated, a distressing situation developed following an injection of ergotamine tartrate for headache. Care should be exercised in establishing the diagnosis of migraine.[21] Use of ergotamine tartrate should be limited to migraine. It should not be used indiscriminately in the treatment of headache. Care should be exercised in the administration of ergotamine tartrate,[22] even in small dosage and for migraine, since it can cause distressing and perhaps serious sequelae in the absence of the commonly recognized contraindications,[2] the result of individual susceptibility to the drug.[22] This may help to avoid unfair criticism and undue fear of the drug, which may result from reactions following its improper use.

4753 Broadway.

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1. Lawson, G. B.; Jackson, W. P., and Gardner, J. E.: A Case of Hemophilia Treated by Venesection, J. A. M. A. 96: 1443 (April 25) 1931.

HEMOPHILIA TREATED BY VENESECTION

GEORGE B. LAWSON, M.D., ROANOKE, VA.
AND
A. B. GRAYBEAL, M.D., MARION, VA.

In March 1931, as already reported,[1] a man aged 51 acutely ill with hemophilia was treated by venesection. In forty-eight hours he was almost free from symptoms. For long intervals he had been completely incapacitated because of joint symptoms occurring with the hemophilia. After this the patient, on the onset of symptoms, would come in for venesection on an average of about once every six weeks. From 400 to 500 cc. of blood was removed each time. The last venesection done by us was on June 23, 1939, when he was apparently in good physical condition except for nervousness and marked apprehension of death. He had been in rather good condition as a whole during the many years that we had been bleeding him, except for some discomfort in one knee. The x-ray film of this knee showed small cystic looking areas in the patella and lower femur.

He was admitted to a government hospital and its report is as follows:

"May 17, 1939: 300 cc. of blood withdrawn this date with improvement for nervousness, eye twitches, etc.

"June 10: Patient getting along well. Has had no bleeding episode as yet. Calm, not as nervous as before and feels O. K.

"June 21: To furlough this date at own request.

"July 16: Admitted to hospital. Returned from furlough this date. General condition same.

"July 17: To barracks this date.

"August 13: Patient readmitted to hospital this date appearing acutely ill with swollen right knee and leg. This is extremely painful on walking. Examination: Patient's face

and body covered with a beady cold perspiration. Skin clammy and patient extremely 'shaky.' Right knee and leg are swollen, tender, hot and very painful on motion even to the examining finger. Diagnosis: Hemorrhage into right knee joint.

"August 15: Patient has a large submental swelling pushing up floor of mouth, which is enlarged, deep and red looking, interfering with speech and swallowing. Probably is still bleeding in soft tissues of neck. Pulse is full and strong but condition doesn't seem very good; 275 cc. of blood under great pressure, removed.

"August 16: Patient seen this a. m. Appears seriously ill. Lower jaw and floor of mouth frozen, apparently with hemorrhage of yesterday evening. Patient dull, listless, cold and clammy. Pulse is 84 and weak. Respirations apparently normal. Right knee stopped hemorrhaging two days ago. Venesection with removal of 275 cc. last p. m. Some improvement reported following treatment. Patient seen again at 3 p. m., restless, semiconscious, pulse of 120 per minute, dry and complaining of very deep thirst. Believe condition generally remains same and that there is still some oozing in tongue. Will give 1,000 cc. 5 per cent dextrose by hyperdermoclysis to allay apparent dehydration. At 8 p. m. condition is poor. Tongue and floor of mouth enormously swollen and deeply hemorrhagic in color (color that of liver). Blood in neck is beginning to discolor the soft tissues. Patient is unable to talk or to swallow; makes known his wishes by pencil and paper. Is extremely anxious over his own condition to point of being frantic."

He died on Aug. 17, 1939, "death being due to massive hemorrhage and contributory cerebral edema."

In January and March 1938 we[2] treated two other hemophiliac patients by venesection, with remarkably good results. One of these, a nephew of our first patient, was a boy aged 10 years. This boy did well until Feb. 8, 1939, when acute pain developed in the left sacro-iliac region. This pain became rapidly worse. Nine days from the onset, anesthesia and complete paralysis developed from the waist down. There was also paralysis of the rectum and bladder. There were a high fever, blood in the urine and subcutaneous hemorrhages.

Lumbar puncture was done February 19, two days after the onset of complete paralysis. The spinal fluid was not under increased pressure and microscopic examination showed only a few red blood cells. In the beginning venesection was performed but was apparently not helpful. This picture of sickness with paralysis, irregular fever, subcutaneous hemorrhages and bloody urine continued for seven weeks before death occurred.

703 Medical Arts Building.

CHYLOUS PERITONITIS

ROLAND L. MAIER, M.D., NEW YORK

History.—A man aged 41 when seen March 16, 1939, gave a history of having been in perfect health on retiring the night before. He was awakened at 1 a. m. with severe abdominal pain about the umbilicus. The pain was constant but there was no nausea or vomiting. The hotel physician was called; he diagnosed the condition as acute appendicitis and advised immediate operation. He gave the patient one-fourth grain (0.016 Gm.) of morphine for the pain. When seen by me, the patient had had the hypodermic and the pain had been greatly relieved, but he looked acutely ill and was perspiring freely. He vomited once half an hour after the morphine had been administered. The temperature was 99 F. by mouth. The abdomen had a boardlike rigidity, and slight pain on pressure was elicited just to the left of the umbilicus. The patient was removed to the hospital, where flat plates revealed no air under the diaphragm. The white count was 10,800, with 56 per cent polymorphonuclears. While the latter procedures were being done, the pain began to recur with its previous intensity, and immediate operation was deemed advisable. The preoperative diagnosis was perforated ulcer or mesenteric embolus. There was no history of trauma.

2. Lawson, G. B., and Graybeal, A. B.: Hemophilia Treated by Venesection, J. A. M. A. 111:2104-2105 (Dec. 3) 1938.

The patient had three attacks of rheumatic fever, at 6, 16 and 18 years of age. A tonsillectomy was performed in 1918. These attacks of rheumatic fever left the patient with a double mitral lesion. His heart had always been well compensated and he had always been able to do his regular work. He had taken no medication for his heart at any time and never had any cardiac symptoms.

Operation.—A right rectus muscle splitting incision was made, and when the peritoneal cavity was opened the lacteals of the small intestine were seen to be very prominent and distended; this was twelve hours after he had eaten dinner. The mesentery about 12 inches from the ileocecal junction was covered with milky exudate for a distance of 3 or 4 inches. This area of mesentery was greatly thickened and somewhat contracted. A small amount, about 20 cc., of milky looking fluid was found in the dependent portions of the peritoneal cavity. This was aspirated and sent to the laboratory for culture and smear. The remainder of the gastrointestinal tract was normal in appearance. No perforations were found and the appendix appeared normal. Since the appendix presented itself in the wound, an appendectomy was performed. The pancreas seemed of normal consistency and there was no evidence of fat necrosis. The abdomen was closed in layers, one rubber dam drain being left at the lower angle of the wound down to the peritoneum.

Postoperative Course.—After the operation the patient was given pitressin every four hours in hopes of preventing postoperative distention. The day after the operation fibrillation set in and the abdomen became distended. Digitalization was quickly instituted and his pulse rate was brought down from 140-160 to 80-85 and kept there by maintenance doses of digitalis. The distention persisted for three days. The stomach was repeatedly lavaged, large amounts of gastric contents being removed each time, and finally the Levine tube was left in constantly. After five days his convalescence was uneventful. The superficial drain was removed in forty-eight hours. Digitalis was discontinued after ten days.

The patient has had no symptoms of any kind since operation and returned to work six weeks from the date of the operation. There is a slight weakness in the abdominal wound as a result of the distention, which broke three or four retention sutures. Laboratory examination of the peritoneal fluid showed no organisms, and a smear revealed only fat droplets.

COMMENT

In a search of the literature no record of a similar case has been found. Allan and Heggie[1] report a case of chylous peritonitis in which there had been a rheumatic heart condition since childhood and in which ascites developed periodically; in the course of years forty paracenteses were performed. The fluid aspirated each time was chylous. This case was fatal and autopsy revealed a fibrotic short, thickened mesentery. Brown[2] in January 1937 reported a case of chylous peritonitis following traumatic rupture of the thoracic duct. Nowhere have I been able to find a report of an acute case such as the one presented here. The conditions found at operation suggest that there was a rupture of one of the lacteals caused by obstruction of the thoracic duct, with back pressure on the smaller lacteals. This would seem plausible in view of the extreme distention of all the lacteals as seen at operation, and the plausible site of rupture was at the greatly thickened and contracted mesentery seen near the ileocecal junction. Whether or not the condition will recur remains to be seen, but to date the patient has had no symptoms of any kind. It is obvious that the operation had little to do with the patient's recovery, but in view of the possibility of a perforation of the intestinal tract it would have been extremely difficult to withhold operation.

121 East Sixtieth Street.

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2. Brown, A. L.: Traumatic Rupture of the Thoracic Duct with Bilateral Chylothorax and Chylous Ascites, Arch. Surg. 34: 120-128 (Jan.) 1937.

Special Article

CONFERENCES ON THERAPY

TREATMENT OF BLOOD DISORDERS

II. THE USE OF IRON AND OTHER METALS

NOTE.—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors. The next report will concern "Treatment of Blood Disorders: III. The Use of Transfusions."

DR. MCKEEN CATTELL: We shall continue our general topic, treatment of disorders of the blood, with special reference to the therapeutic use of mixtures of metals and the effects of copper in relation to iron therapy. We shall hear first from Dr. Summerson, who will discuss the chemical and physiologic basis for the use of metals other than iron.

EXPERIMENTAL ASPECTS

DR. WILLIAM H. SUMMERSON: When one speaks about the value of metals other than iron in the therapy of anemias, interest is primarily directed to copper because of the demonstration that copper is associated with iron in the formation of hemoglobin in the animal body. This was experimentally established about a decade ago, and although it was challenged at the time the facts have withstood all attempts to break them down. I think that no one seriously questions nowadays, from a biologic point of view at any rate, the significance of copper in the processes of hemoglobin formation in the animal body.

The significance of copper in hemoglobin formation has been clearly demonstrated in a variety of animals such as the rat, the rabbit, the pig, the chicken, the sheep and the dog. Although a requirement for copper has not been conclusively demonstrated in the human being, it seems quite reasonable to expect that what is true for lower animals is also true for man. The difficulties of experimental demonstration in human beings obviously preclude any such conclusive demonstration as is possible in the case of experimental animals.

The mode of action of copper in the formation of hemoglobin is entirely unknown. The amounts of copper required are very small and out of all proportion to the amounts of iron that are converted to hemoglobin in the presence of copper. Thus far the only significant facts that have been demonstrated with regard to the way copper acts in the body are that it apparently does not influence either the absorption of iron or the storage of iron in the body but that it aids in the mobilization of stored iron and facilitates the conversion of stored iron into hemoglobin.

Because of the small amounts of copper required by the organism, attention has been directed to a possible catalytic action of copper on hemoglobin synthesis. Two possibilities suggest themselves in this connection. There is the possibility that a copper-containing, intermediate compound is necessary in the chain of reactions leading to hemoglobin synthesis and that copper is subsequently split off and the molecule ultimately built up into hemoglobin. There is also a possibility that copper is an activator for a specific enzyme system that is associated with the formation of hemoglobin in the body. No conclusive evidence for either of these theories has as yet been adduced.

As I stated, there has been no clearcut demonstration of the necessity for copper in the formation of hemoglobin in the human being. The difficulty is probably due to the fact that the amounts of copper required by the organism are quite small, and it is difficult to control the experimental diet of the human being in such a way as to produce a copper deficiency. It has been shown that copper is present in small quantities in practically all foods, and a computation of the copper content of normal human diets has demonstrated that the dietary intake of copper varies, depending on the type and amount of food eaten, from about 0.8 mg. of copper a day for children to about 4.8 mg. a day for adults.

How much copper does the human organism need? One way to get an answer to that question is by copper balance studies. On the basis of such studies it has been estimated that children require as an optimal daily intake about 0.1 mg. of copper per kilogram of body weight. If you take that as the average daily requirement of copper for the human being, you can see that a 70 Kg. man would require 7 mg. of copper a day. I just cited 4.8 mg. as the daily copper intake on an average diet, so there is not a great discrepancy between the copper needs of the human being and the amount of copper that he gets in the diet. The possibility arises, and this is suggested I think by clinical experience, that there may be a chronic copper deficiency, that is, a state in which small amounts of added copper would be of value. This accords with the clinical experience that small amounts of added copper are sometimes of value.

The best results from the use of copper in the therapy of hypochromic anemia in the clinic have been obtained in the anemias of infancy, and there are increasing numbers of case reports in the literature which show, but by no means conclusively, some effect associated with the addition of copper to iron in the therapy.

With regard to the treatment of hypochromic anemia occurring in adults, the evidence is even less impressive, probably because it is so much more difficult to produce a copper deficiency anemia in the adult than in the young growing organism. However, it has been reported that certain cases of stubborn hypochromic anemia relatively resistant to iron administration have responded more favorably to the addition of copper along with the iron than have controls to whom iron alone was administered. All of these results are complicated by the fact that practically all commercial iron preparations contain varying amounts of copper, and I think that in no case in the clinic have the experimental conditions been as carefully defined as in the laboratory. Naturally clinical definition is less feasible.

The general view at the present time with regard to the clinical value of copper might be summed up as follows: Most patients with hypochromic anemia seem to require no added copper and get along perfectly well with an ordinary iron salt, yet there is also a certain proportion of cases in which the addition of copper along with the iron seems to lead to greater increases in the hemoglobin level in the blood than without the added copper.

Another element has become of interest in the last few years with regard to hemoglobin formation, and that is cobalt. Cobalt will not replace copper in the usual experimental animals; that is, in the rat and in certain other animals it has apparently no influence on

hemoglobin formation. It is certainly not comparable to copper in the rat. But it has been shown to be entirely comparable to copper in one species, namely, sheep. There are a number of areas throughout the world where sheep suffer from a sickness which is known by various local terms but which is almost invariably characterized by an anemia similar to chlorosis. It has been shown that the addition of neither iron nor copper to the diet will cure this anemia but that the addition of small amounts of cobalt will bring about a rapid and complete cure. So far as I know that is the only experimental demonstration of the value of cobalt in hemoglobin synthesis in nutritional anemia. Cobalt has, however, another action which is of interest, namely, that in the normal animal it produces a polycythemia. That fact has proved of some value in the study of experimentally induced polycythemias in animals. The significance of cobalt in the treatment of clinical anemias I think is quite indefinite at the present time. The chief interest in this metal is associated with the demonstration that at least in one species cobalt is an essential element for the conversion of iron into hemoglobin. There is also the interesting fact of the marked stimulation of the bone marrow associated with cobalt administration leading to an experimental polycythemia.

DR. CATTELL: Are there some questions we might put to Dr. Summerson now?

DR. HARRY GOLD: Do I understand that hemoglobin formation does not go on in the absence of copper?

DR. SUMMERSON: That is certainly true for all the animals that I listed.

DR. CLAUDE E. FORKNER: But it may go on in the presence of other elements? Will not other elements substitute for copper?

DR. SUMMERSON: I don't believe so. That was one of the points that was brought out at the very beginning of the work on copper. I think most people agree that stimulation due to other elements than copper is minimal, if present at all, and, if it is obtained, that it is probably due to contamination with copper in the preparations.

DR. GOLD: Are arsenic and manganese out of the question now as substitutes for copper?

DR. SUMMERSON: That is a very interesting question. In one series of experiments arsenic was the only element aside from copper that showed a very slight stimulating action, but it did not compare with that following copper. As far as we know, manganese has no function in hemoglobin formation, but there is no doubt that it is necessary for normal growth.

DR. PAUL REZNIKOFF: What about germanium? That was long considered an important element.

DR. SUMMERSON: Its importance certainly does not apply to the rat.

STUDENT: Have these sheep you mentioned been put on a copper deficient diet? In other words, was cobalt a substitute or was there some additional factor?

DR. SUMMERSON: On a milk diet lambs—I always refer to young animals—develop an anemia. This is cured by the addition of copper along with iron to the diet. At the time these experiments were made, the significance of cobalt was not realized. In the experiments I mentioned a little while ago it was found that the presence of iron as well as copper in an otherwise adequate diet for the pastural lamb had no influence on the disease, but that cobalt had to be added along with the iron.

STUDENT: Is that taken as evidence that the cobalt acts as a direct substitute for the copper?

DR. SUMMERSON: I would say that you can demonstrate in one type of experiment that the animal needs copper. You can demonstrate in another type of experiment that he also needs cobalt. It seems to me that the evidence indicates a need for both cobalt and copper along with iron in the case of the sheep.

DR. FORKNER: I should like to ask Dr. Summerson whether in his experiments there has been any indication that copper produces any untoward effects, perhaps over a long period of time. I think a great many clinicians hesitate to use copper because they fear some possible toxic effect. I am thinking, for instance, of Mallory's work on hemochromatosis.

DR. SUMMERSON: That is always a possibility, but the amounts of copper that one gives are very small. Animals have been maintained on a mineralized milk diet, that is, milk plus copper, iron and manganese, for long periods and they appear to be quite normal on that diet. No one has ever detected any pathologic effect of copper in the amount that is ordinarily sufficient to stimulate maximal hemoglobin formation. If large amounts of copper are given, then of course it is quite toxic.

IRON, COPPER, COBALT, MANGANESE, GERMANIUM, NICKEL

DR. CATTELL: Dr. Reznikoff, will you discuss from a practical standpoint the use of the several metals which have been mentioned?

DR. REZNIKOFF: As Dr. Summerson has pointed out, most of the work—and I think probably the best work—on the value of copper and cobalt in anemias and other conditions affecting the blood has been done on animals.

Among the workers who have studied human beings, mostly children, Sachs, of Omaha, I believe has contributed the most careful quantitative work. Sachs and his co-workers came to the conclusion on the basis of the determination of copper and iron in the blood of children that there was a reciprocal relationship between these two metals in the blood; that is, when iron was increased copper was decreased, and vice versa. Not only was that true of the anemias, but they found that the relationship also held in a few cases of polycythemia; that is, as the blood count in polycythemia decreased under treatment, the iron content of the blood decreased but the copper content increased. They postulated that copper may be mobilized as a stimulator of hematopoietic activity. They also felt that it acted in the capacity of an emergency oxidative catalyst. This suggests that copper is not an essential part of the structure of hemoglobin but, as Dr. Summerson has pointed out, really a catalyst.

With regard to adult patients we are confronted with problems which are not easy of solution. We can accept the experimental work on animals, but with practically all of our patients we cannot find that any of these adjuvants are of any significance. The probability is that the principle holds true that copper is necessary for the development of a normal hemoglobin content in the red blood cell; but, possibly because the necessary amount of copper is so small that it is always supplied in food or medication, or for other reasons, the fact

remains that in adult hematology we never find it necessary to give copper to a patient. There are products on the market which contain copper and iron, but I do not know of any case in which I felt copper should be administered, and I do not know of any reports in the literature which make it clear that without copper the anemia of adult patients would not have been cured.

As for metals other than iron and copper, Kato, at least in his work up to 1937, felt very strongly that in infants cobalt could act as a definite accelerator of red blood cell and hemoglobin formation. He felt it was necessary for both, but there again he assumed that cobalt was just a catalyst. There are some workers, and I think Elvehjem is one of them, who think that manganese can be ranked as an equivalent of copper so far as rat growth is concerned; however, they do not commit themselves as to the role of manganese in the formation of hemoglobin. There are suggestions throughout the literature that manganese, cobalt, germanium and perhaps nickel can simulate the action of copper but in much less degree, and thus there would be only a quantitative difference. For practical purposes copper is the most effective, but perhaps we should not exclude entirely the possibility that these other elements may have some effect on hemoglobin formation.

In the literature on the effect of copper and cobalt in anemia, I have not found what I could call a crucial experiment, and that would be this: When you give iron to an iron deficient patient who has an anemia, there is a reticulocyte rise of varying degree before the hemoglobin begins to rise. Some time after the reticulocyte count returns to the base level or establishes a plateau, copper should be administered to see if there is any secondary reticulocyte effect. If a secondary reticulocyte rise is produced, this would be fairly good evidence that an extra stimulant was thrown in which was not present when iron alone was given, or iron plus the contaminations.

Our interest in cobalt in adult patients centers not so much in anemia as in polycythemia. As Dr. Summerson has said, there has been a good deal of work on the effect of cobalt in polycythemia, but that it plays any role in this condition has been shown only with regard to animals. With the polycythemic patient studies of the blood show that there is not any increase in the new red blood cells as the result of cobalt, if we take reticulocyte counts as a gage; also, if we examine the bone marrow, no increase in the number of immature cells is seen. The Barrons found that the administration of ascorbic acid prevented the cobalt experimental polycythemia, and therefore they postulated that ascorbic acid is one of the regulators of hematopoiesis. We accept the fact that ascorbic acid is a regulator of hematopoiesis, but our experience has been that if vitamin C is withheld an anemia develops; in other words, ascorbic acid is, if anything, a factor in producing red blood cells and not in inhibiting red blood cell formation, as seemed to be the case in the experimental cobalt work. However, we may be dealing with two different functions; that is, cobalt may produce polycythemia in a different way than ascorbic acid produces a normal red cell response.

Davis has recently been working with polycythemia induced by cobalt chiefly in dogs. He found that if he gave liver extract, which must be unheated, or if he gave choline derivatives (I believe he used choline hydrochloride for the most part) he could prevent the polycythemic effect of cobalt. Immediately clinicians began to use liver extract of the type that he mentioned for patients suffering from polycythemia. It was soon found by Major that it had no effect on polycythemic patients.

IRON AND COPPER DEFICIENCY IN THE INFANT

DR. CATTELL: Next I shall ask Dr. Smith to make a few remarks about the problems that arise in the treatment of anemia in children.

DR. CARL H. SMITH: The previous speakers have referred to iron or iron in combination with copper and other adjuvants in the treatment of the anemias of infancy and childhood. In discussing the need of added copper from a clinical standpoint, it should be noted that not all the striking results obtained with animals can be transferred directly to anemic infants and children. In spite of the fact that the nutritional anemia of infants closely resembles the iron deficiency anemia of laboratory animals induced by milk diets, the reports concerning the need of copper as a supplement for the anemic infant have been conflicting. It seems to me desirable, therefore, to review the problem of iron deficiency in the infant both as to its pathogenesis and as to its treatment with iron and other metals.

At birth, with the termination of anoxemia, the fetal polycythemia is no longer needed and destruction of red cells and hemoglobin occurs. Figures for the hemoglobin value at birth vary from 16 to 23 Gm. per hundred cubic centimeters, according to studies from various parts of the world. This variation probably depends on the climatic conditions and the racial, hygienic and dietetic factors prevailing in the particular localities where these studies were conducted. The most pronounced drop in hemoglobin occurs after the first week or ten days of life, after which the hemoglobin continues to fall until the age of from 6 weeks to 2 months, when a level is reached. Except for a slight rise occurring between 3 and 6 months, the hemoglobin level for normal children fluctuates within a narrow range during the first two years of life. The values for normal infants from the age of 2 months to the end of the first year, according to recent studies, range from about 10 to 12 Gm. of hemoglobin per hundred cubic centimeters of blood. Therefore, when we speak of nutritional anemia in infants we mean that the hemoglobin value is found to be consistently below this lower limit of 10 Gm.

The question has often arisen Should these values of from 10 to 12 Gm. be elevated? In obtaining an answer to this an inherent difficulty arises from the lack of data as to what the optimum hemoglobin value is; that is, what value will promote the greatest growth and development of the infant. Although we usually find that normal infants on adequate diets have an average hemoglobin value of about 11 Gm., it is possible by the administration of iron to boost this figure. For instance, Elvehjem and his associates were able to raise the hemoglobin value of normal infants from between 9 and 11 Gm. to 12 and 13.5 Gm. per hundred cubic centimeters of blood by the daily addition to their diets of 25 mg. of iron and 1 mg. of copper. It is not yet certain, however, whether it is desirable to maintain these higher levels and we do not know, for instance, whether raising the hemoglobin by routine iron administration will decrease the susceptibility of these infants to infection. Closely controlled observations would be

necessary to determine the advantage of the elevated hemoglobin with respect to morbidity, mortality and growth.

Since we do not have these facts, the range of hemoglobin values obtained for infants whose physical development measures up to normal standards should be used as the basis for comparison. As we have said, following the neonatal period the full term infant of average birth weight and in good nutrition as seen in private practice has an average hemoglobin of 11 Gm. or more, and we know that the majority of these babies get along perfectly well. For practical purposes, therefore, the value of 11 Gm. should be designated as the lower limit of normal. This is an arbitrary figure, however, and it is not unusual to encounter infants, particularly premature babies or twins, who appear normal in every respect but whose hemoglobin after the second month falls somewhat below this value.

What factors contribute to the development of a nutritional anemia in infancy? Particular attention should be directed to the hemoglobin level of all infants who are growing rapidly, to premature babies and twins, to those troubled by frequent infections, to those whose mothers during the latter part of pregnancy were known to have suffered from a profound anemia, and to infants who during the neonatal period were suffering from a blood dyscrasia such as primary anemia of the newborn or who have survived the condition of icterus gravis. Prolonged lactation or a diet largely of milk, especially when associated with the refusal of solid food, constitutes an outstanding cause of nutritional anemia. Until solid foods are introduced in the diet, the intake of iron and probably of other adjuvants concerned with hemoglobin synthesis is meager, and the young infant depends largely on prenatal stores and products derived from blood destruction for the fulfilment of its metabolic requirements.

Another question is "Can the initial sharp drop in the hemoglobin level after birth be prevented?" Many studies have been conducted with full term and premature infants in the endeavor to forestall the low hemoglobin levels reached at 6 weeks to 2 months of age by administering iron, with or without adjuvants, even as early as in the first weeks of life. It has been demonstrated that the reduction in hemoglobin occurring during the first six weeks of life could not be prevented, although the terminal level reached was not so low and the subsequent hemoglobin values were higher than in the untreated cases. The available evidence supports the conclusion that the early drop in hemoglobin is physiologic and due to intrinsic factors.

On the other hand, experience has shown that the hemoglobin level after the second and third months can be elevated by iron administration instituted at this time, and we usually begin treatment if the value falls below 10 Gm. per hundred cubic centimeters of blood. With premature infants and twins, hemoglobin determinations should be begun during the second month of life. With normal full term infants, these may be postponed until the third month. Nutritional anemia should be looked for in all infants of 6 months or over, since at this time iron stores are usually depleted, although it may develop earlier. Parsons has described cases occurring at or shortly after birth. By following closely infants whose hemoglobin fluctuates about the level of 10 Gm., carrying out tests at frequent intervals and instituting antianemic therapy if the same or lower values are consistently obtained, treatment is confined to infants in whom an iron deficiency becomes apparent. This obviates the necessity for the routine administration of iron to all infants.

How should these babies with nutritional anemia be treated? While adequate food iron usually insures protection against the development of anemia in infancy, it cannot be depended on in treatment and an inorganic iron salt is essential for cure. The choice of the preparation for the infant as well as for the adult depends on its known activity, ease of administration, tolerance and inexpensiveness. In the case of the infant, the solubility also is particularly important, since inorganic salts that are readily ingested by an adult may be unsuitable for a baby. The iron salt preferably should be soluble. Reduced iron and saccharated ferrous carbonate, because of their insolubility, have the disadvantage of requiring suspension, but they can be given to older children. Although there are several soluble iron salts suitable for use in infancy, the efficacy of which has been amply demonstrated, my own experience has been with two of these, namely iron and ammonium citrates and ferrous sulfate. The former may be prescribed in a 10 per cent solution or in capsules. For the infant, the capsules must be opened and the contents dissolved in a suitable vehicle. It is important to emphasize that in administering iron to a baby one has to tell the mother exactly how it is to be given. One has to tell her specifically "Take the iron salt out of the capsule and put it in the baby's orange juice, milk or water." I once had the experience, however, of having a father call me up to tell me that after two weeks the baby had finally swallowed a capsule.

The dose of iron depends on a number of considerations. The absorption of iron from the intestine of the infant is subject to a variety of influences, in part similar to those of the adult and in part resulting from local conditions incident to its own stage of development. Therefore a specific dosage cannot be definitely assigned for a particular age. Furthermore, the dosage should be controlled by frequent hemoglobin estimations and the tolerance of the infant for the preparation. It is advisable to start treatment with a small dose, let us say 5 grains (0.3 Gm.) of iron and ammonium citrates, since at times vomiting or diarrhea follows its use. Should these untoward symptoms occur during the course of treatment, the quantity of iron may be temporarily reduced or another iron salt may be employed. In the infant with nutritional anemia of a moderate grade, the desired hemoglobin level can usually be obtained with a daily dose approximating 1 grain (0.06 Gm.) of iron and ammonium citrates per pound of body weight. Thus the total dose is usually from 15 to 30 grains (1 to 2 Gm.). With more severe anemias in older infants, 45 grains (3 Gm.) or more is sometimes required. With the continued use of the maximum dose, however, the urine should be examined for evidence of kidney irritation. In recent years we have employed ferrous sulfate almost exclusively. A daily dose of from 6 to 8 grains (0.4 to 0.5 Gm.) of this salt has been sufficient to produce a satisfactory reticulocyte response and the restoration of the normal hemoglobin, red cell and hematocrit levels within a period of from two to three weeks. The smaller dose required in the case of the ferrous salt has the advantage of minimizing the likelihood of gastrointestinal disturbances. It is prescribed in infancy in the form of an elixir, each teaspoonful containing 2 grains (0.13 Gm.) of ferrous sulfate or approximately 26 mg. of metallic iron. It must be emphasized that the most favorable

results with iron therapy in infancy are obtained by the exercise of skill in administration of these salts, and the possibility of refusal and of gastrointestinal upsets necessitates a familiarity with the use of more than one preparation. One cannot depend on one iron salt alone.

The next question is Should copper be used? In our experience it has not been necessary to employ copper in the treatment of nutritional anemia, although there are studies to show that its addition in minute traces results in prompt acceleration of hemoglobin production from a previously stationary level. The results on this point are conflicting. The studies of Elvehjem have already been referred to in which iron and copper raised the hemoglobin of normal infants as high as 13.5 Gm. per hundred cubic centimeters of blood, whereas hemoglobin levels of 14 Gm. were obtained by Stephenson with the use of iron salts without any copper supplements. For the occasional infant in whom copper deficiency may occur, as evidenced by a refractory state of the anemia, minute amounts of this element, 1 mg. daily (equivalent to 4 mg. of copper sulfate) may be included in the iron prescription.

Although achlorhydria sometimes accompanies iron deficiency in infancy, the administration of hydrochloric acid is without value. Parenteral liver preparations are also unnecessary.

DISCUSSION OF QUESTIONS

DR. CATTELL: The meeting is now open for general discussion. Are there some questions you would like to put to Dr. Smith?

DR. REZNIKOFF: I should like to ask Dr. Smith whether in his opinion the work published by Dr. Hugh Josephs at Johns Hopkins on babies who are recovering from pneumonia and have anemia is fairly conclusive. To all these anemic children he gave iron in rather large amounts and could get no rise in hemoglobin until he gave them copper.

DR. SMITH: It is true that Josephs obtained poor results with iron alone in some of his cases of convalescent pneumonia in infants, but the majority did show a definite response although a maximum rise in hemoglobin did not occur until copper therapy was instituted. My own experience is that iron therapy is unsatisfactory during the stage of acute infection, but once this has subsided then it is entirely effective without the addition of copper. The termination of infection is difficult to detect, and low grade fevers may persist without obvious cause. In such a case the lack of response to iron may prove of clinical importance. When iron in adequate doses—from 6 to 8 grains of ferrous sulfate daily—is administered to a young child with anemia of moderate severity, the absence of a reticulocyte response and a failure of the hemoglobin to return to a level of about 11 Gm. per hundred cubic centimeters of blood and of the hematocrit to reach a value of 36 per cent in from two to three weeks suggest continued activity of the infectious process or that the diagnosis of anemia on a purely nutritional basis is to be questioned. When anemia accompanies prolonged infection, even of low grade, it is more expeditious to treat the infant or child with blood transfusion than to temporize with iron.

DR. REZNIKOFF: Dr. Smith uses 6 grains of ferrous sulfate and that is equivalent to about 100 mg. of iron a day. It appears that with the infant as well as the adult larger doses of the ferric salt are given in order to obtain a satisfactory therapeutic effect.

DR. JANET TRAVELL: What is the usual dose of iron when given in the form of the ferric ammonium citrate?

DR. SMITH: For the ferric ammonium citrate we use the brown scales, which contain not less than 16 per cent of iron. The effective dosage for infants is roughly 1 grain of this salt per pound of body weight, which corresponds to 10 mg. of metallic iron per pound of body weight, does it not?

DR. TRAVELL: That is, for a 20 pound baby the usual doses would be 100 mg. of ferrous iron and 200 mg. of ferric iron. It is interesting that 100 mg. of iron is the dose used by Schlutz, Morse and Oldham in comparing the relative effectiveness of these same two iron salts, ferrous sulfate and ferric ammonium citrate, in nutritional anemias of infants. They found that 100 mg. of iron supplied as iron and ammonium citrates and 100 mg. of iron supplied as ferrous sulfate were equally efficacious.

DR. SMITH: We have found that at times even larger doses of iron and ammonium citrates may be required than the doses suggested. That caution must be exercised with the larger amounts was illustrated in our experience with an infant for whom the dose of iron and ammonium citrates was gradually raised to 90 grains (6 Gm.). With this amount kidney irritation occurred, manifested by an increased number of red cells and casts in the urine as determined by the Addis method.

DR. FORKNER: I think it ought to be pointed out that forty or fifty years ago very large doses of iron were given as compared with those we use now. Then as the result of the metabolic studies of Stockman and others demonstrating that little of this iron was utilized, smaller doses came to be recommended. For many years small and inadequate doses of iron were given, probably because the problem was attacked too scientifically, and only after about 1920 was it again discovered that large doses of iron had to be given in order to obtain an optimal effect.

DR. SUMMERSON: I think it is very interesting that the optimum dose of iron recommended by Dr. Reznikoff at our last conference is from ten to twenty times the amount of iron apparently required by the body, taking the average daily requirement as 15 mg.

DR. FORKNER: One point which Dr. Smith touched on was the element of infection. If a patient has fever or infection one can expect very little effect from iron or any other hematopoietic stimulating agent so that one has to take that factor into account. Frequently patients in the ward are given large doses of iron when they have an active infection and one wonders why they don't respond, but it is pretty clear that infection markedly inhibits the utilization of iron.

DR. REZNIKOFF: Dr. Forkner has brought up a very important point. In all this discussion we have to consider what is the condition of the patient. For example, it is fairly well agreed that the amount of iron utilized by the organism to produce hemoglobin depends to a considerable extent on the needs of the organism.

We once did an interesting experiment with potassium ferrocyanide. If one gives a normal animal potassium ferrocyanide, about 100 per cent is excreted in the urine. The same was true when we took it ourselves. None of the iron was apparently utilized. But an animal with an iron deficiency anemia is able to retain about one third of the iron given. That was a striking illustration of the fact that various factors like iron depletion, infection and many other conditions probably occurring in patients will determine the utilization of iron.

Dr. Travell: A striking experimental demonstration of the influence of need on utilization has been obtained recently by Hahn and his collaborators by following the course of a radioactive isotope of iron in the body. By this technic it is possible to distinguish between the newly absorbed iron and that previously present in any form or location. When Whipple's standard anemic dogs were fed radioactive iron, within twenty-four hours an appreciable amount had accumulated in the spleen, liver, bone marrow, red blood cells and blood plasma. About fifty to a hundred times as much iron was absorbed by the blood and viscera in the anemic animal as was absorbed in normal dogs or dogs rendered plethoric by blood transfusions, when similarly treated. The authors are inclined to believe that absorption is regulated selectively by the mucosa of the small intestine and not by the concentration gradient of iron existing between the gastrointestinal contents and the blood plasma.

SUMMARY

Dr. Cattell: In summarizing today's conference, the following points stand out:

Copper has been shown to play an important role in hemoglobin formation in a variety of experimental animals. All that is known regarding its mode of action is that in some way it facilitates the conversion of stored iron into hemoglobin. Although it is reasonable to assume that it has a similar function in hematopoiesis in human beings, it has been impossible to demonstrate this, except possibly in the nutritional anemias of infancy. The difficulties are these: First, the daily requirement of copper is very small and it is not feasible to control the diet so as to produce a copper deficiency; second, nearly all commercial preparations of iron contain copper in varying amounts, often enough to supply an existing copper deficiency. In adults, it is questionable whether any benefit is derived from the addition of copper to iron therapy.

Cobalt is another element which under certain conditions can stimulate erythrocyte and hemoglobin formation. This action is seen in the production of experimental polycythemia by cobalt, and also in the cure of certain nutritional anemias of sheep. In other species, however, cobalt has not been proved of value in the treatment of nutritional anemias. It has not been established that any other metals are essential for hemoglobin synthesis.

Iron therapy in the nutritional anemias of infancy presents problems which are fundamentally similar to those encountered in adult hypochromic anemias and discussed at our last conference. Again the clinical impression is that ferrous iron is more effective than ferric iron. The dose in infants seems to be roughly proportional to that recommended for adults, calculated on the basis of body weight, usually about 15 to 30 grains of ferric ammonium citrates or from 6 to 8 grains of ferrous sulfate daily by mouth. As in the iron deficiency anemias of adults, the administration of hydrochloric acid is without benefit, food iron is relatively ineffective, and the efficacy of iron therapy may be interfered with by various factors, especially infection. In infants the choice of an iron preparation is usually limited by the fact that a soluble salt must be used. Unanimity is lacking as to the exact indications for iron therapy in infants, but it is generally agreed that when hemoglobin values less than 10 Gm. per hundred cubic centimeters of blood is consistently obtained, iron is indicated. Copper deficiency is more likely to play a role in the anemias of infants than of adults, and in rare instances iron-refractory anemias may be benefited by the addition of a minute amount of copper, 1 mg. a day, to the iron prescription.

Council on Physical Therapy

The Council on Physical Therapy has authorized publication of the following report. Howard A. Carter, Secretary.

HOLMSPRAY VAGINAL POWDER INSUFFLATOR ACCEPTABLE

Manufacturer: T. J. Holmes Company, Inc., Chartley, Mass.

The Holmspray Vaginal Powder Insufflator, No. 622, provides a means by which powders effective in the treatment of Trichomonas vaginalis and other organisms can be blown into the vaginal cavity. The device consists of a glass bottle to which is attached spray parts, a rubber shield and rubber bulb; the metal parts are chromium plated. The spray tube is interchangeable and is supplied in sizes for adults and infants.

The Council had the Holmspray Vaginal Powder Insufflator investigated and the report indicated that it insufflates the powder satisfactorily into the vagina. However, the rubber shield if placed close to the introitus interferes with the insufflation of the powder probably owing to the fact that it makes a closed circuit. It is, however, a satisfactory apparatus for blowing the powder into the vaginal lumen with a bivalve speculum in place.

The Council voted to accept the Holmspray Vaginal Insufflator, No. 622, for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

Paul Nicholas Leech, Secretary.

CHORIONIC GONADOTROPIN (FOLLUTEIN)

The gonadotropic substance excreted in the urine of pregnant women is a water-soluble substance which has been prepared in a highly purified form. It is a glycoprotein containing about 12 per cent of galactose.

In rodents injection of pregnancy urine, or certain extracts thereof, induces follicular growth and corpus luteum formation. When the gonadotropic activity of pregnancy urine was first demonstrated by Zondek, it was considered that the responsible substance was secreted by the anterior pituitary. At the time, the concept was advanced that this gonadotropin consisted of two hormones—prolan A, the follicle stimulating hormone, and prolan B, the luteinizing hormone—on the basis of its effect in the rat, mouse and rabbit. Further experimentation, however, has revealed that this substance is a single entity and not composed of two factors, that it arises from the placenta rather than from the pituitary, and that it differs fundamentally from the gonadotropins of the anterior lobe.

A significant physiologic difference between chorionic gonadotropin and preparations from the anterior pituitary is the inability of the former to stimulate to any appreciable extent the ovary of the monkey or the human being. Injection of chorionic gonadotropin into primates will not induce follicular growth or corpus luteum formation. On the contrary, reliable investigators have observed definite degenerative changes in the ovaries of women and monkeys treated with this substance. In addition, no clearcut endometrial responses have been observed in primates treated in this manner, which indicates conclusively the inability of this substance to stimulate the growth of normal ovarian structures.

The physiologic action of chorionic gonadotropin is not limited to the female, but it exerts a definite effect on the male reproductive organs. It is generally agreed that this substance acts on the interstitial cells of the testes, causing them to elaborate

the androgenic hormone of the testis, which in turn induces growth of the accessory sex organs. This substance is effective in male monkeys and human beings. Among the reactions induced in the monkey is the descent of the testes in the prepuberal animal. In some animals there may be some increase in the size of the semeniferous tubules, but there is little if any effect on the germinal epithelium. Spermatogenesis is, however, maintained by chorionic gonadotropin in recently hypophysectomized rats, but it is not restored after atrophy or induced in normal immature rats.

The therapeutic application of chorionic gonadotropin has covered a wide range of conditions. Many of the trials have been on an unsound or improperly conceived basis. Its use in the treatment of ovarian disturbance, for example, has no scientific rationale at the present time, although when it was first introduced for the treatment of these dysfunctions the physiologic basis for therapy appeared excellent.

CHORIONIC GONADOTROPIN (FOLLUTEIN).—The water-soluble gonadotropic substance obtained from the urine of pregnant women. This preparation is standardized in international units. One international unit equals 0.1 milligram of a standardized powder (see Council Report, J. A. M. A. **113**:2418 [Dec. 30] 1939).

Actions and Uses.—Its use is recommended in the treatment of cryptorchidism where there are no anatomic lesions causing obstruction of the testicular descent. The diagnosis of an anatomic lesion can often be made in this manner where this therapy fails. Thus the surgical treatment of cryptorchidism may be instituted at an early age when it is found that hormonotherapy cannot induce descent. Injections should not be prolonged after six to eight weeks if no descent is obtained, since excessive therapy may result in undesirable responses of precocious puberty and possibly other harmful reactions.

The diagnosis of cryptorchidism should not include those cases which have been termed pseudocryptorchids, in which the testes are maintained in the inguinal canal as the result of reflex muscular spasm. It will be found that the testes return to the normal scrotal position on gentle handling and warmth.

Chorionic gonadotropin therapy in other disorders is still considered experimental because of the lack of sufficient published data. This treatment of hypogonadism in the adult is considered experimental at the present time. Its value in the treatment of uterine bleeding of functional nature is also as yet unproved, although numerous reports on this therapy have appeared in scientific publications. There is less enthusiasm for this therapy at the present time than there was several years ago. Considerable disagreement exists among the various investigators regarding the type of bleeding benefited by chorionic gonadotropin therapy.

Dosage.—The usual dose in treating cryptorchidism is from 200 to 500 international units two to three times a week. Long-continued injections may be dangerous and treatment should not be maintained after eight weeks in the absence of progressive descent. Therapy should be discontinued on the development of signs of precocious maturity.

Follutein-Squibb.—A nonproprietary brand of chorionic gonadotropin (follutein)-N. N. R. Both follutein and chorionic gonadotropin are nonproprietary terms.

Manufactured by E. R. Squibb & Sons, New Brunswick, N. J., by license under U. S. patent 1,910,298. E. R. Squibb & Sons agree to withdraw their rights to Follutein as a proprietary name.

Vials Follutein-Squibb, 500 International Units: A glycerin solution of chorionic gonadotropin (follutein)-N. N. R. which, when diluted with the 4 cc. of sterile distilled water in the accompanying vial, provides a solution having a potency of 100 international units per cubic centimeter.

Vials Follutein-Squibb, 1,000 International Units: A glycerin solution of chorionic gonadotropin (follutein)-N. N. R. which, when diluted with the 8 cc. of sterile distilled water in the accompanying vial, provides a solution having a potency of 100 international units per cubic centimeter.

Vials Follutein-Squibb, 5,000 International Units: A glycerin solution of chorionic gonadotropin (follutein)-N. N. R. which, when diluted with the 8 cc. of sterile distilled water in the accompanying vial, provides a solution having a potency of 500 international units per cubic centimeter.

Follutein is prepared from the urine of normal pregnant women by precipitating the active principle from the urine by addition of ethyl alcohol to give a concentration of more than 85 per cent alcohol, extracting the hormone from the precipitate with dilute alkaline water, and then salting out the active principle from this solution with ammonium sulfate. Further purification is made by fractionating in 50 per cent alcohol at the isoelectric point of impurities, which are removed by centrifuging. The active principle is obtained by raising the alcohol concentration to 85 per cent. The precipitate is removed by filtration and dried. This precipitate is dissolved in 90 per cent glycerin, 0.5 per cent phenol is added, and then it is passed through a Berkefeld filter. The concentrated solution is then tested for sterility and for its activity. The final material is assayed biologically on infantile rats and compared in this procedure to the International Standard powder. The product is then diluted until its biologic activity is equal to that of the international standard.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

FOODS FOR SPECIAL DIETETIC PURPOSES (*See* Accepted Foods, 1939, p. 315).

S & W Fine Foods, Inc., San Francisco.

NUTRADIET BRAND WHOLE CARROTS, water packed, without added sugar or salt.

Analysis (submitted by manufacturer).—Moisture 87.0%, total solids 8.3%, ash 0.3%, fat (ether extract) 0.2%, protein (N × 6.25) 0.5%, crude fiber 0.8%, carbohydrates other than crude fiber (by difference) 6.5%.

Calories.—0.30 per gram; 9 per ounce.

NUTRADIET BRAND VALENCIA ORANGE JUICE UNSWEETENED.

Analysis (submitted by manufacturer).—Moisture 87.0%, total solids 13.0%, ash 0.4%, fat (ether extract) 0.1%, protein (N × 6.25) 1.0%, reducing sugars as invert sugar 5.6%, sucrose (copper reduction method) 4.8%, crude fiber 0.1%, carbohydrates other than crude fiber (by difference) 11.4%, titratable acidity as citric acid 1.0%.

Calories.—0.51 per gram; 14 per ounce.

MILK AND MILK PRODUCTS OTHER THAN BUTTER (*See* Accepted Foods, 1939, p. 230).

Fort Dodge Creamery Company, Fort Dodge, Iowa.

GREEN GABLE BRAND EVAPORATED MILK.

Analysis (submitted by manufacturer).—Moisture 74.1%, total solids 25.9%, fat 7.9%, milk solids not fat 18.0%, ash 1.5%, protein (N × 6.38) 6.7%, lactose 9.0%, carbohydrate (by difference) 9.8%.

Calories.—1.3 per gram; 36.9 per avoirdupois ounce.

The Borden Company, New York.

BORDEN'S EAGLE BRAND SWEETENED CONDENSED MILK.

Analysis (submitted by manufacturer).—Moisture 27.5%, total solids 72.5%, ash 1.9%, fat (ether extract) 9.1%, protein (N × 6.38) 8.1%, sucrose 42.0%, milk solids 30.5%, non-fat milk solids 21.5%, carbohydrates (by difference) 54.4%.

Calories.—3.27 per gram; 93 per ounce.

PREPARATIONS USED IN THE FEEDING OF INFANTS (*See* Accepted Foods, 1939, p. 156).

Libby, McNeill & Libby, Chicago.

LIBBY'S BRAND HOMOGENIZED BABY FOODS FORMULATED COMBINATION NO. 7, vegetable soup containing celery, potatoes, peas, carrots, tomato juice, soya bean flour and barley flour with a small amount of added sodium chloride.

Analysis (submitted by manufacturer).—Moisture 5.2%, total solids 14.8%, ash 1.3%, sodium chloride 0.2%, fat (ether extract) 0.02%, protein (N × 6.25) 4.0%, crude fiber 0.4%, carbohydrates other than crude fiber (by difference) 9.1%, calcium (Ca) 0.032%, phosphorus (P) 0.075%, iron (Fe) 0.0014%, copper (Cu) 0.00028%.

Report of titration test (1939) indicates that this product contains 0.023 mg. of ascorbic acid per gram, 0.64 per ounce. Protocols of biologic assay (1939) indicate that this product contains approximately 22.5 U. S. P. units of vitamin A per gram, 639 per ounce; and 0.33 Sherman-Bourquin unit of vitamin G (riboflavin) per gram, 9.4 units per ounce. Rat growth tests have demonstrated the presence of small amounts of vitamin B_1 (thiamine).

Calories.—0.53 per gram; 15.1 per ounce.

SUGARS AND SYRUPS (*See* Accepted Foods, 1939, p. 327).

Penick & Ford, Ltd., Incorporated, New York.

PENICK BRAND IMITATION MAPLE WAFFLE SYRUP, a mixture of corn syrup and sugar syrup with imitation maple flavor.

Analysis (submitted by manufacturer).—Moisture 25.3%, total solids 74.7%, ash 0.2%, nitrogen 0.003%, sucrose 26.0%, reducing sugars as dextrose (before inversion) 28.8%, carbohydrates other than crude fiber (by difference) 74.5%.

Calories.—2.98 per gram; 85 per ounce.

The Pure-Grape Sugar Manufacturing Co., Ltd., Athens, Greece, product distributed in the United States by Aegean Trading Company, New York.

GRAPE SUGAR (DEXTROSE), a carbohydrate for use as a sweetening in the preparation of other foods, made from fresh grapes or raisins.

Analysis (submitted by manufacturer).—Moisture 10.1%; ash 0.4%; sugar as glucose (Munson-Walker) 89.7%; polarization 10% solution at 25 C., 9.3 degrees angular; specific rotation at 25 C., 46.5 degrees; soluble starch, chlorides and sulfates, none; arsenic and heavy metals, none; sulfite, trace.

Calories.—About 3.6 per gram; 102 per ounce, depending on the amount of water present.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - - Chicago, Ill.

Cable Address - - - - "Medic, Chicago"

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SATURDAY, JUNE 8, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

SUPREME COURT DECIDES FOR TRIAL ON INDICTMENT OF AMERICAN MEDICAL ASSOCIATION AND OTHERS UNDER SHERMAN ANTI-TRUST ACT

On Dec. 20, 1938, an indictment was filed in the District Court of the United States for the District of Columbia charging the American Medical Association, Medical Society of the District of Columbia, Harris County (Texas) Medical Society, Washington Academy of Surgery and twenty-one individual defendants with conspiracy to violate section 3 of the Sherman Anti-Trust Act. The defendants filed a demurrer to the indictment. This means that the defendants contended that, even assuming everything alleged in the indictment to be true, there was no violation of the law as charged. Of course, on the issue thus formed the courts were bound to take as true, whether or not it was in fact true, each and every allegation of the indictment. The District Court agreed with the defendants' contention and on July 26, 1939, sustained the demurrer and dismissed the indictment.[1]

From that order Thurman Arnold, as Assistant Attorney General, prosecuted an appeal to the Court of Appeals of the District of Columbia. While the case was pending in the Court of Appeals, and before a decision there, the government filed a petition in the Supreme Court of the United States for a writ of certiorari to remove the case from the Court of Appeals to the Supreme Court of the United States. The defendants did not oppose this petition, but the Supreme Court denied it,[2] probably on the theory that the issues presented were raised by demurrer and that the case had not been tried and the real facts did not appear in the record.

Thereafter the Court of Appeals proceeded to consider the case and on March 4, 1940, it reversed the order of the District Court and remanded the case to the District Court for trial.[3] The Court of Appeals in its opinion said:

> Defendants say that what they are charged with doing amounts to no more than the regulation of membership in the society and the selection of the persons with whom they wish to associate; that under their rules disobedient members may lawfully be disciplined, and that disciplination does not amount to unreasonable restraint. This may very well be true, and in considering the contention we are not unmindful of the importance of rules of conduct in medical practice, rules which can best be made by the profession itself. We recognize, in common with an almost universal public opinion, that in the last half century, through this means, the quack and the charlatan have been largely deprived of the opportunity of preying on the unfortunate and the credulous. We also recognize that in personal conduct and in professional skill the rules and canons, so established, have aided in raising the standards of medical practice to the advantage of the whole country. We are mindful of a generally known fact that under these rules and standards there has developed an esprit de corps largely as a result of which the members of the profession contribute a considerable portion of their time to the relief of the unfortunate and the destitute. All of which may well be acknowledged to their credit.

The court went on to say that, notwithstanding the foregoing, the defendants ought not restrain trade and that it thought under the allegations of the indictment the true facts should be brought out by a trial of the case, and that on a trial, if in fact restraint was shown, it would not necessarily violate the law if such a restraint was reasonable as a regulation of professional practice and that whether or not such restraint was reasonable as a regulation of professional practice must be shown in evidence on the trial of the case.

On April 29, 1940, the defendants filed in the Supreme Court of the United States their petition for a writ of certiorari to review the decision of the said Court of Appeals. The government opposed this petition and argued that the Supreme Court of the United States ought not decide the issues in this case on a

1. 28 Fed. Sup. 752.
2. 84 L. Ed. (Adv.) 96.
3. 110 Fed. (2d) 703.

demurrer to the indictment but ought to wait until the case had been tried and the real facts appear of record.

The Supreme Court apparently agreed with the government's contention in this regard, because on June 3 it denied the defendants' petition for a writ of certiorari. The Supreme Court of the United States did not decide the legal issues or any of them against the defendants but merely refused to review the decision of the Court of Appeals at this time and in effect said that the defendants would have to stand trial before it would pass on the issues.

The American Medical Association, its officers and the other defendants in this case feel certain that they have not violated the Sherman Anti-Trust Act and feel certain that they will be vindicated on a trial of this case, but they regret the expense that will necessarily be incurred in such a trial.

HOSPITAL CONSTRUCTION BILL PASSES SENATE

Without a dissenting voice the Wagner-George bill for the construction of hospital facilities, health, diagnostic and treatment centers, and facilities relating thereto passed the Senate, May 30. Two amendments to the bill, as reported by the Committee on Education and Labor, were proposed from the floor of the Senate; both were unanimously adopted. Senator Barbour of New Jersey sponsored an amendment to assure that facilities to be constructed under the bill will be made available without discrimination on account of race, creed or color. This amendment provides that, where separate health facilities are required by law for separate population groups, equitable provisions on the basis of need will be made for facilities and services of like quality for each such group. The other amendment, sponsored by Senator Murray of Montana and adopted without opposition, provides that the eight appointed members of the National Advisory Hospital Council shall be selected not only from leading medical or scientific authorities but also from osteopathic authorities who are outstanding in matters pertaining to hospitals and other public services. No doubt Surgeon General Parran, who may have the responsibility of nomination of members of the proposed hospital council, will have some difficulty in finding an osteopath who is "outstanding in matters pertaining to hospitals and other public services."

The bill now goes to the House of Representatives, where it will receive consideration by the Committee on Interstate and Foreign Commerce. The bill should be modified so that the definition of the term "hospital" covers institutions primarily for the care of the sick rather than health, diagnostic and treatment centers. It should be amended to eliminate the meaningless reference to "outstanding" osteopathic authorities. It should be amended to give the Advisory Council a positive voice in the construction program not only for the first year but also during the last five of the six years that the bill will be in operation. It should be amended to provide for the selection of the members of this council by the Chief Executive.

This proposal is an experimental venture; it would be most unfortunate if the inclusion of unwise provisions prevented a sound appraisal of its fundamental merits.

A NEW MANUAL FOR HEALTH EXAMINATIONS

A committee appointed by the Board of Trustees to cooperate with the Bureau of Health Education in revising the Manual for Periodic Health Examinations of Apparently Healthy Persons has completed its work and has issued a revision under the title Periodic Health Examination: A Manual for Physicians.[1] The new manual represents a complete revision of the material which was first issued in 1925 and superficially revised in 1932. The committee endeavored to consider some of the reasons why the periodic health examination of apparently normal persons had not been more widely accepted as a habitual practice even among intelligent and well educated persons. There were two reasons, the committee concluded, for the situation: (1) excessive and unjustifiable claims for what periodic health examinations can be expected to accomplish and (2) a feeling on the part of the public, whether justified or not, that periodic health examinations, though theoretically desirable, are excessively expensive.

In the preface to the 1940 edition, the committee takes cognizance of these barriers to progress and indicates definite limitations in the claims to be made on behalf of periodic health examinations: "No promise or prophecy of good health in the future should be offered. The only honest or valid claims are that it serves to measure the present health status of the individual, subject to the qualification that obscure or insidious disease may not always be discoverable by methods at present available. Further, the examination discloses habits of living and environmental factors which may be unhealthful but susceptible of correction. Finally, of course, it gives opportunity for treatment of early or preclinical stages of disease." The committee also, for the first time, advances a new conception of the periodic health examination, consisting of a basic examination of the patient including health, history, medical examination and only chemical and microscopic urinalysis, hemoglobin determination and stained blood smear and blood test for syphilis as routine laboratory procedures. The committee suggests that "additional laboratory procedures such as gastric analysis, blood cell and differential counts, basal metabolic rate determination, blood chemistry, x-ray examinations, functional tests and consultations with specialists be considered as

1. Periodic Health Examination: A Manual for Physicians, Bureau of Health Education, Chicago, American Medical Association. Single copies 25 cents.

accessory methods to be used only where the basic examination indicates their necessity" and that "whenever the patient is unable to afford the accessory examinations and these are not available at public expense, the physician should nevertheless proceed to advise the patient to the best of his ability under the circumstances."

In most respects there can be little disagreement with the recommendations made, although not all will concur in the statement that the taking and recording of blood pressure measurements constitute a portion of the physical examination record which can be satisfactorily obtained by a "lay assistant, office clerk or nurse with accuracy."

Complete instructions are included in the manual for all the necessary physical examinations and many suggestions are given for hygienic advice to the patient. New features not found in previous editions of the manual include a suggested order of examination which correlates items on the physical examination blank with corresponding paragraphs in the manual of instructions. Except for the introduction, all paragraphs in the manual are numbered for ready reference to this suggested order of examination. Diagrams for posture diagnosis are included, the principal industrial hazards are enumerated, chief diseases and defects needing treatment are tabulated and there is a fairly complete discussion of general principles in prescribing diets, including some sample menus with computation of protein, fat and carbohydrate contents, unit values of vitamins A, B_1, C and G, and caloric values. There is a table of 100 calory portions of common foodstuffs and many other practical suggestions useful to the physician. The manual is intensively indexed.

There has been a coincidental revision of the record blank for periodic health examination necessitated by the fundamental changes in the manual.

The revised concept of a basic and relatively inexpensive health examination, plus the use of more extensive laboratory investigations only when specially indicated, should make a new appeal both to physicians and to the public. Greater growth in the popularity of the periodic health examination is desirable, since it has a definite if limited place in any program of individual health maintenance. Moreover, it opens wide possibilities to the physician as a health counselor and adviser.

Appreciation is due the committee [2] and the individual and organizational consultants [3] who cooperated with the Bureau of Health Education in the preparation of the manual.

2. The members of the committee are Drs. Fremont A. Chandler, George H. Coleman, W. C. Danforth, Haven Emerson, Parker Heath, Leland S. McKittrick, Gordon B. New, William A. O'Brien, C. D. Selby, Paul D. White, and W. W. Bauer, chairman.

3. Walter C. Alvarez, M.D., Ruth Cowan Clouse, Ph.D., Robert L. Dickinson, M.D., Harold S. Diehl, M.D., Otto H. Foerster, M.D., Donald A. Laird, Ph.D., R. G. Leland, M.D., Lon W. Morrey, D.D.S., Carl M. Peterson, M.D., Paul A. Teschner, M.D., S. Bernard Wortis, M.D., American Heart Association, American Society for the Control of Cancer, American Society for the Hard of Hearing, National Committee for Mental Hygiene, National Society for the Prevention of Blindness and National Tuberculosis Association.

TULAREMIA

Since Francis [1] in 1919 recognized the identity of "deer fly fever" with the "plaguelike" disease of rodents which had been described by McCoy [2] several years earlier, the presence of human cases of this disease has been disclosed in forty-eight states and in the District of Columbia, as well as in a number of foreign countries. The symptoms, diagnosis and pathology of this disease, named tularemia by Francis and often called "rabbit fever," were extensively described a number of years ago in THE JOURNAL.[3] Now attention is called to the increasing number of human cases and deaths from tularemia. A recent report [4] devoted to a discussion of the sources, symptoms and prevention of tularemia states that there were 2,088 cases and 139 deaths from this disease in the United States alone in 1938. Moreover, complete returns will probably show that the death toll of the disease in 1938 was exceeded in 1939, since in the latter year 2,200 cases were reported.

While it is true that more than 90 per cent of the human cases of tularemia are due to contact with infected wild rabbits, it may also be noted that at the present time twenty-four types of American wild life have been implicated in transmitting the causative agent, Bacterium tularense, to man. Infections have resulted, for instance, from the bite of insects, such as the wood tick, dog tick and horsefly, as well as from the bites of animals such as the skunk, raccoon, coyote, tree squirrel, ground squirrel, opossum, dog and lamb. Since the vast majority of human cases result from contact with wild rabbits, however, those persons who are particularly exposed to infection are market men, hunters, housewives and others who handle and dress these animals. In these cases infection may be caused by pricking the skin with a piece of broken bone, by cutting with the skinning knife or by allowing infected body fluid, such as blood, to get into an abrasion of the skin. Even the pelts of infected animals may convey the infection.

Most patients recover from tularemia without permanent ill effects and thereafter enjoy immunity from the disease. Nevertheless about 5 per cent of the patients die, often after developing pneumonia. Despite reports in the literature of the favorable therapeutic effect of antiserum, it is now reported that there is no specific preventive or curative treatment for the disease.[4] Those who are exposed to tularemia must take especial precautions to prevent infection. The use of rubber gloves by those who handle animals which may be infected has been suggested. Extreme care should be taken to avoid cutting or pricking the hands, and any possibly infected material which gets on the hands should be thoroughly washed off with soap and water and the

1. Francis, Edward: Deer Fly Fever, or Pahvant Valley Plague, Pub. Health Rep. 34:2061 (Sept. 12) 1919; The Occurrence of Tularemia in Nature as a Disease of Man, ibid. 36:1731 (July 29) 1921.

2. McCoy, G. W.: Bull. 43, U. S. P. H. & M. H. S., April 1911.

3. Francis, Edward: Symptoms, Diagnosis and Pathology of Tularemia, J. A. M. A. 91:1155 (Oct. 20) 1928.

4. Tularemia (Rabbit Fever), Pub. Health Rep. 55:667 (April 19) 1940.

hands should be disinfected. Since the disease may also be contracted by the consumption of infected meat that is insufficiently cooked, it is advisable to cook thoroughly any possibly infected meat. The need for stressing these preventive measures is obvious, since the reported increase in the number of human cases and deaths from tularemia indicates that many people who are exposed to infection are unaware of the danger.

Current Comment

THE NEW YORK TIMES SINGS A NEW TUNE

In the New York *Times* for Sunday, June 2, under the editorial column called Topics of the Times, appears the following statement: "Hitherto we have been stressing the health of the underprivileged. Now is the time to recall that health conditions in the lower one third of the nation have made notable gains in our generation. Our discontent has been impatience with what we considered insufficient progress. The fact of progress no one could specifically deny. The health of the Negro people in the crowded districts lags far behind conditions among the white population. But the health of the Negro people today is far better than it was a generation ago. Today, and for the duration of the emergency, it is the improvement already made and not the gap still to be covered that should be chiefly stressed." Apparently the *Times* has discovered that the welfare of a part of the nation is dependent on the welfare of the whole, and that the security of one third is dependent on the security of three thirds. Perhaps the new point of view will lead its editors to the reflection that progress in the care of the sick is not to be made by breaking down confidence of the people in the medical profession, which is the only body in the country legally, scientifically and by experience qualified to care for the sick.

"IN DEFENSE OF THE INDIVIDUAL"

In the *Atlantic Monthly* for June, Mr. Albert Jay Nock presents a stimulating essay with the title of this comment. In general his essay is an attack on collectivism and a review of the insidious manner of its approach to the American way of living. Mr. Nock particularly recommends "Democracy vs. Socialism," a work by Max Hirsch, which he says presents the "complete case against every known form and shade of State collectivism, from Marxism and Fascism down to the New Deal, leaving not a shred of respectability, or even of plausibility, to the claims of many of them." He continues, "Out of the mouths of the collectivists themselves it shows that the State does not and cannot administer a collectivist economy without bringing on consequences so calamitous as to end in a complete rebarbarization of society." The occurrences in recent years in Russia and in Germany should be sufficient to prove the truth of this latter statement. Mr. Nock points out that state collectivism made its way in England step by step, where it was to be brought in by "the progressive legalization of one bit of its program after another, thus steadily widening the scope of State control." Indeed he feels that state collectivism is as fully dominant in England as it is in the systems which frankly call themselves totalitarian and that its dictates are enforced by the same means as those systems employ. The United States has approached state collectivism step by step. Mr. Nock feels that the character of the people of the United States is such as to be more easy of approach to such a system than other countries because it has been our tendency always to go to the state with any difficulties which would take time or be bothersome for us to settle for ourselves. He continues: "Some people are out of work—let the State make jobs for them. Some are hungry—let the State feed them. Some monopolies are oppressive—let the State break them up. There is a shortage of houses—let the State build more. Some have too much money—let the State take it away from them and redistribute it." To this we might add "There are some inadequacies and inefficiencies in parts of medical service—let the State take over all of medical service." Particularly hazardous is the concept that the difficulty with various forms of collectivism is not in collectivism itself but in the method of its administration. Thus one gets the notion that collectivism might work in Russia or in Germany if one could replace the present leaders with others, that collectivism might work better in this country under the administration of one party than it does under another. What Americans must remember is the basic thought that democracy depends on the principle of individual responsibility, and it is the breakdown of this principle that destroys democracy!

DIGITALIS FOR OBESITY

Too much publicity has apparently been given to the reports of a method of weight reduction which involves administration of digitalis for suppressing the appetite. The underlying thesis that the food intake determines the weight is, of course, correct; definite suppression of appetite will ordinarily be followed by loss of weight. Moreover the use of ipecac and similar drugs may result in a loss of appetite even before nausea and vomiting are manifested. Whether or not digitalis can produce a loss of appetite without harmful effects is more debatable. The work of Hatcher and Weiss in particular has shown that the nausea produced by digitalis is a reflex the sensory organ for which does not appear to be located in the heart. Thus the type of nausea which digitalis produces is at least partly due to factors other than gastric irritation. Indeed, nausea and vomiting are toxic symptoms of digitalis and constitute a warning to decrease or stop the administration of the drug. The observations reported by Bram[1] on this method of reducing body weight have attracted the attention of some writers for the public. Confirmatory evidence for his views is lacking. The method cannot be generally recommended unless its efficacy and safety have been thoroughly demonstrated by carefully controlled observations. At present the use of this technic is clearly in the experimental stage and uncontrolled use should be discouraged.

1. Bram, Israel: M. Rec. 151: 131 (Feb. 21) 1940.

ORGANIZATION SECTION

OFFICIAL NOTES

ADDRESSES BY DR. VAN ETTEN

June 10 Health Center, Washington Heights, N. Y.
June 10 House of Delegates, American Medical Association, The Waldorf-Astoria, New York.
June 11 President's address, American Medical Association, The Waldorf-Astoria, New York.
June 11 Broadcast 5:15 p. m., National Broadcasting Station, New York.
June 12 Women's Auxiliary luncheon, Hotel Pennsylvania, New York.
June 12 National Board of Medical Examiners' dinner, The Waldorf-Astoria.
June 12 Catholic Physicians Guild dinner, Hotel Biltmore, New York.
June 13 Broadcast "Adventures in Science," WABC, New York.
June 19 Canadian Medical Association, Toronto, Canada.
June 25 Health Officers' Conference, Saratoga, N. Y.

THE NEW YORK SESSION

Open House at Merck & Co.

Physicians attending the annual session of the American Medical Association in New York are cordially invited to attend the Merck "open house" at Rahway, N. J., Friday afternoon, June 14, from 1:30 to 5:30 o'clock. Transportation will be provided. For additional details and cards of admission, physicians are asked to call at the Merck Exhibit, booth 280, Grand Central Palace.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 3230, the Wagner-George Hospital Construction Act of 1940, has passed the Senate and, in the House, has been referred to the Committee on Interstate and Foreign Commerce. Senator Murray of Montana sponsored an amendment to the bill from the floor of the Senate proposing osteopathic representation on the National Advisory Hospital Council. The amendment was unanimously adopted. S. J. Res. 256 has passed the Senate, designating June 22 in each year as Doctor's Day. In the House this joint resolution has been referred to the Committee on the Judiciary. S. 1964 has been reported to the House, proposing to authorize national banking associations to contribute to community funds or to charitable, philanthropic or benevolent instrumentalities conducive to public welfare. S. 1460 has passed the Senate, providing uniform reciprocal hospitalization in any Army or Navy Hospital for retired personnel of the Army, Navy, Marine Corps and Coast Guard and Fleet Naval and Fleet Marine Corps. S. 3131 has passed the Senate, extending the benefits of the United States Employees' Compensation Act to members of the Officers' Reserve Corps and of the Enlisted Reserve Corps of the Army who were physically injured in line of duty while performing active duty or engaged in authorized training between dates of Feb. 28, 1925, and July 15, 1939, both inclusive. S. 3266 has passed the Senate, providing pensions, compensation, retirement pay and hospital benefits for certain Air Corps Reserve officers who were disabled while on active duty with the Regular Army. S. 3607, authorizing research by the United States Public Health Service with respect to the cause, diagnosis and treatment of dental diseases, was reached on the Senate calendar May 28, but consideration of the bill was prevented by an objection lodged by Senator Gerry of Rhode Island. S. 3617 has passed the Senate, granting the consent and approval of Congress to an interstate compact relating to control and reduction of pollution in the Ohio River drainage basin. H. R. 9236 has passed the House and Senate, providing an additional appropriation of $75,000 for the preparation of "talking books" for the blind.

Bills Introduced.—S. 3960, introduced by Senator Sheppard of Texas, proposes that the present grade of captain, Medical Administrative Corps, United States Army Reserve, be advanced to colonel, Medical Administrative Corps, United States Army Reserve. H. R. 9861, introduced by Representative Fish of New York, proposes to amend the act entitled "An Act to recognize the high public service rendered by Major Walter Reed and those associated with him in the discovery of the cause and means of transmission of yellow fever" by including therein the name of Dr. J. Wilson Poucher. H. R. 9889, introduced by Representative Whelchel of Georgia, proposes a federal appropriation of $100,000 to erect a hospital at Jefferson, Ga., as a memorial to Dr. Crawford W. Long, "who was the first physician to perform an operation by use of ether, and for carrying on scientific research to further the study of surgery." The hospital, it is proposed, will be named "Crawford W. Long Memorial Hospital."

DISTRICT OF COLUMBIA

Change in Status.—S. 2013 has passed the Senate, proposing to amend the Code of the District of Columbia to provide for the organization and regulation of cooperative associations.

WOMAN'S AUXILIARY

Arkansas

The auxiliary to the Pulaski County Medical Society held a recent meeting in Little Rock with forty-one members attending. Miss Erle Chambers, executive secretary of the Arkansas Tuberculosis Association, spoke on the "Program of the Association in Arkansas."

Mrs. W. R. Brooksher Jr. was named general chairman of the Arrangements Committee of Women's Activities for the annual meeting of the auxiliary to the Arkansas Medical Society in Fort Smith, April 15-17. Members of the auxiliary to the Sebastian County Medical Society were hostesses to the ladies who attended the annual meeting.

Michigan

The auxiliary to the Bay County Medical Society met in Bay City recently with thirty-seven members in attendance. Miss Libby Kessler reviewed "Dr. Hudson's Secret Journal."

At a recent meeting of the auxiliary to the Saginaw County Medical Society members voted to contribute to the purchase of an iron lung for the hospital and to send *Hygeia* to twenty rural schools of the county.

The auxiliary to the Kalamazoo County Medical Society met at the Kalamazoo Academy of Medicine recently. Dr. Paul W. Harrison spoke on his experiences in Arabia.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

State Society Condemns Patents for Profit.—The Medical Association of the State of Alabama adopted a resolution, April 18, in which it condemns as unethical the patenting of drugs or medical appliances for profit whether the patent is held by a physician or is transferred by him to some university or medical research foundation. This action, according to the resolution, deprives the needy sick of the benefits of many new medical discoveries through the acts of medical men. Introduced by Dr. Marye Y. Dabney, Birmingham, the resolution points out that there is a growing tendency to patent drugs in the name of universities and foundations in connection with universities. The effect of the patents is to increase the price of the drugs because of the royalties imposed by the foundations, thus affecting the needy public who are prevented from buying them on account of the necessarily high prices asked.

CALIFORNIA

Society News.—The Los Angeles Society of Neurology and Psychiatry was addressed, April 17, among others, by Drs. Cullen Ward Irish and Karl O. Von Hagen on "Douglas's 'The Physical Mechanism of the Human Mind.'"——At a meeting of the Los Angeles Society of Ophthalmology and Otolaryngology, April 22, observing the thirty-fifth anniversary of its founding, the speakers included Drs. Etta C. Jeancon on "Cataract Operation in Tuberculosis"; Clinton A. Wilson, "Unexplained Optic Neuritis," and Helen E. Preston, "Congenital Iris Atrophy with Anterior Synechiae." A dinner was given to honor founders and past presidents of the society.——At the first and organization meeting of the Los Angeles County Physicians' Aid Association, April 3, the following officers were chosen: Drs. Elizabeth M. Hohl, president; Herbert O. Barnes, vice president; Olga McNeile, secretary, and Alfred R. Robbins, treasurer. Its official address will be 671 North Mariposa Avenue, Los Angeles.

FLORIDA

New Society of Specialists.—The Florida Society of Ophthalmology and Otolaryngology was formed at a meeting in Tampa, April 29. Officers are Drs. Hermon Marshall Taylor, Jacksonville, president; Sherman B. Forbes, Tampa, vice president, and Carl E. Dunaway, Miami, secretary. During the annual meeting of the state medical association in 1939, ophthalmologists and otolaryngologists met informally with a view to a permanent organization, but final action was delayed until this year.

Short Graduate Course.—The Florida Medical Association will hold its annual graduate short course at the George Washington Hotel, Jacksonville, June 24-29. The instructors will be:

Dr. Raymond W. McNealy, associate professor of surgery, Northwestern University Medical School, Chicago.
Dr. William T. Pride, professor of obstetrics, University of Tennessee College of Medicine, Memphis.
Dr. Willis Campbell, professor of orthopedic surgery, University of Tennessee College of Medicine.
Dr. Henry M. Thomas Jr., associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore.
Dr. Daniel C. Darrow, associate professor of pediatrics, Yale University School of Medicine, New Haven, Conn.
Dr. Stuart N. Michaux, professor of gynecology, Medical College of Virginia, Richmond.

Dr. Paul Padget, Baltimore, will present the course in venereal diseases, which has been substituted for neuropsychiatry this year.

IDAHO

Society News.—The Pocatello Medical Society was addressed in Pocatello, April 4, by Drs. Richard P. Howard and Abram M. Newton, Pocatello, who presented a symposium on the medical and surgical treatment of peptic ulcer. At an earlier meeting of the society a symposium on sulfanilamide and related drugs, their indications, contraindications, dosage and mode of action was presented by Drs. Wilfred L. Olsen, Ben C. Eisenberg and Eugene V. Simison.

Professional Groups Protest Regimentation.—Physicians, dentists and pharmacists of south central Idaho recently took steps to form a committee that will serve as a working unit against measures which might bring governmental control of the professions, newspapers reported. The action was taken at a dinner meeting in Twin Falls. The speakers included Dr. Harry E. Rhodehamel, Spokane, Wash., northwestern representative of the National Physicians' Committee for Extension of Medical Service; Donald S. Whitehead, lieutenant-governor of Idaho and a pharmacist, and F. A. Kallusky, D.D.S., Buhl, president of the South Central Dental Society. Dr. Harry E. Lamb, Twin Falls, president of the Southside Medical Society, opened the meeting and J. J. Lynch, secretary of the state pharmaceutical group, was toastmaster at the dinner.

ILLINOIS

State Medical Election.—Dr. Charles H. Phifer, Chicago, was chosen president-elect of the Illinois State Medical Society at its annual meeting in Peoria, May 23, and Dr. James S. Templeton, Pinckneyville, was installed as president. Other officers are Drs. Arthur Sprenger, Peoria, and James H. Finch, Champaign, vice presidents; A. J. Markley, Belvidere, treasurer, and Harold M. Camp, Monmouth, secretary. The 1941 meeting will be held in Chicago.

Chicago

The Luckhardt Lecture.—The seventh annual Arno B. Luckhardt Lecture of Delta chapter of Phi Beta Pi medical schools of the University of Chicago was delivered by Dr. Andrew C. Ivy, Nathan Smith Davis professor of physiology and professor of pharmacology, Northwestern University Medical School, April 19. His subject was "The Gastro-Intestinal Hormones: An Illustration of the Influence of a Great Teacher."

Society News.—The Chicago Society of Allergy devoted its meeting, May 20, to a symposium on intrinsic asthma; the speakers were Drs. Edward G. Tatge, Evanston, Ill., Clarence Bernstein Jr., Morris A. Kaplan and Morris J. Hoffman.——The Chicago Society of Internal Medicine was addressed, May 27, among others, by Fred S. Grodins, Stafford L. Osborne and Dr. Andrew C. Ivy on "The Effect of Bile Salts on Hepatic Blood Flow." Dr. James G. Carr gave the presidential address on "The Physician and the Internist."——Drs. Hollis E. Potter, Chicago, and Bruce H. Douglas, Detroit, discussed "The Miniature X-Ray Film" before the Chicago Tuberculosis Society, May 16.

Dr. Harvey to Become Professor Emeritus.—Dr. Basil C. H. Harvey, professor of anatomy and dean of students, including medical students, Division of Biological Sciences, University of Chicago, will become professor emeritus September 1. Born in Watford, Ont., Canada, in 1875, Dr. Harvey graduated at the University of Toronto Faculty of Medicine in 1898. He practiced medicine in Watford until 1901, when he joined the faculty of the University of Chicago as assistant in anatomy, and was made full professor in 1917. In 1923 he was named dean of medical students and in 1931 his deanship was extended to include all students in the newly created Division of Biological Sciences. Dr. Harvey was a major in the World War.

Lectures on Biochemistry.—A group of lectures on biochemistry divided into three series has been arranged by the department of biochemistry, University of Chicago, as a special feature of the first term of the summer quarter. The first group will be delivered June 25-27 by Dr. Cyril N. H. Long, Sterling professor of physiologic chemistry, Yale University School of Medicine, New Haven, Conn., on "Recent Studies on the Pancreas-Suprarenal-Pituitary Relations in Diabetes Mellitus." Edward A. Doisy, Ph.D., professor and director of the department of biochemistry, St. Louis University School of Medicine, St. Louis, will give the second series, July 9-10, on "The Vitamin K Problem." The last group will be on "Recent Advances in Enzyme Chemistry" with James Batcheller Sumner, Ph.D., professor of biochemistry, Cornell University Medical College, New York, as the speaker, July 15-17. Tickets may be obtained by writing to the director of the summer quarter, University of Chicago.

INDIANA

Society News.—The Greene County Medical Society was addressed in Linton, May 16, by Dr. Harold J. Pierce, Terre Haute, on "General Considerations of Carcinoma."——Dr. Otto L. Siewert, Logansport, discussed "The Eye in General Practice" before the Carroll County Medical Society in Camden, May 10.——Dr. William M. Doughty, Cincinnati, addressed the

Dearborn-Ohio County Medical Society in Lawrenceburg, May 2, on "Fractures of the Jaw."——The Parke-Vermillion Counties Medical Society was addressed in Clinton, May 15, by Dr. Alexander W. Cavins, Terre Haute, on "Myomas."——Dr. Ernest R. Carlo, Fort Wayne, discussed "Heart Disease in Children" before the Huntington County Medical Society, Huntington, May 7.

Serum Center to be Established.—The Indiana University School of Medicine, Indianapolis, has accepted funds from the Variety Club of Indianapolis to establish a convalescent serum center on the campus for the use of the medical center and physicians throughout the state. According to the state medical journal, the serum center will be the first to be established in Indiana on any extensive scale. At present Indiana physicians needing serums must send outside the state, the closest station being Chicago. Dr. Matthew Winters, professor and head of the department of pediatrics, has been appointed chairman of a committee to supervise the establishment of the center.

IOWA

Twin Lakes District Meeting.—The annual meeting of the Twin Lakes District Medical Society will be held at Rockwell City, June 20. The program has been designed for the general practitioner and speakers will include:

Dr. Nelson W. Barker, associate professor of medicine, University of Minnesota Graduate School, Minneapolis-Rochester, Minn.

Dr. Frederic W. Schlutz, chairman of the department of pediatrics, School of Medicine of the Division of Biological Sciences, University of Chicago.

Dr. Edward L. Cornell, assistant professor of obstetrics, Northwestern University Medical School, Chicago.

Dr. John S. Coulter, associate professor of physical therapy at Northwestern.

Dr. Frank R. Peterson, professor and head of the department of general surgery, State University of Iowa College of Medicine, Iowa City.

Dr. Ira H. Lockwood, Kansas City, will discuss "Medical Economics and the National Physicians Committee."

MAINE

Society News.—Dr. Herbert T. Kelly, Philadelphia, discussed "Important Phases of Nutrition and Vitamin Deficiency Disorders" before the Cumberland County Medical Society in Portland, April 25.——Dr. James M. Parker, Portland, addressed the Portland Medical Club, April 2, on "The Surgical Treatment of Varicose Veins."——The Kennebec County Medical Society was addressed in Augusta, April 18, by Dr. William Reid Morrison, Boston, on "Management of Complications of Appendicitis."——Dr. Joseph H. Pratt, Boston, addressed the Penobscot County Medical Association, April 16, on "Recent Advances in the Diagnosis and Treatment of Pancreatic Disease."——A symposium on the management of head injuries was conducted before the York County Medical Society in Kennebunk, April 3; the speakers included Drs. Harry Eugene Macdonald Jr. and Erastus E. Holt Jr., Portland; William V. Cox, Lewiston; John P. Goodrich, Waterville, and Harry Brinkman, Wilton.

MASSACHUSETTS

Kober Medal Awarded to Dr. Frederick Russell.—The George M. Kober Medal for 1940 was awarded to Dr. Frederick F. Russell, professor of preventive medicine and epidemiology, Harvard Medical School, Boston, at the annual meeting of the Association of American Physicians in Atlantic City, May 8. Dr. Russell, who served in both the Spanish-American and World wars, took charge of the yellow fever and malaria work of the Rockefeller Foundation in 1920. Since his resignation five years ago, Dr. Russell has been teaching. In 1941 Dr. William deB. MacNider, dean and Kenan resident professor of pharmacology, University of North Carolina School of Medicine, Chapel Hill, N. C., will be awarded the medal for his research on the liver and kidneys, it was announced.

Society News.—A symposium on adolescence was presented before the New England Pediatric Society in Boston and Brookline, May 15; the speakers were Drs. James S. Plant, Newark, N. J.; John Rock and Mr. C. E. Allen.——The New England Hospital Association will hold its 1941 meeting at the Hotel Statler, Boston, March 12-14.——The Pentucket Association of Physicians was addressed in Haverhill, May 9, by Dr. Robert E. Fleming, Boston, on "The Problem of Alcoholism in Its Relation to the Medical Profession" and Mr. Frank Stratton, Boston, "Analysis of Alcohol: Its Results and Relations to Conditions and Circumstances." Dr. Leroy M. S. Miner, Boston, will address the society, June 27, on "Contact Points of Two Professions." Dr. Miner is both a doctor of medicine and a dentist.——The New England Roentgen Ray Society was addressed in Boston, April 26, among others, by Drs. George M. Wyatt and William E. Ladd on "Genito-Urinary Diagnosis and Treatment in Infants and Children: Persistent Pyuria, Kidney Embryoma and Retroperitoneal Neuroblastoma."——Dr. Charles H. Best, Toronto, discussed "Factors Influencing the Production and Liberation of Insulin from the Pancreas" before the Boylston Medical Society, Boston, May 13.

MICHIGAN

Vox Pop.—Dr. Linn M. Cudworth, Perry, was interviewed on the Vox Pop program recently over the Columbia Broadcasting System, following his selection as the typical American small town doctor. Dr. Cudworth was chosen from the physicians nominated by the letters of Vox Pop listeners. Born in Bainbridge, N. Y., Dr. Cudworth observed his seventieth birthday February 23. All his forty-four years of practice, since his graduation at Baltimore University School of Medicine in 1896, have been spent in and around Perry. In the interview, Dr. Cudworth depicted generally the typical life of a small town doctor.

Society News.—Dr. Roby John F. Renshaw, Cleveland, discussed "Gastroscopy, Its Use in Diagnosis and Treatment" before the Wayne County Medical Society, Detroit, May 13. This was a joint session with the East Side Medical Society. Dr. Henry H. Kessler, Newark, N. J., discussed "Rehabilitation of the Industrially Disabled" before the former society, May 6.——Dr. Frederick A. Coller, Ann Arbor, addressed the Washtenaw County Medical Society, May 14, on "Some Surgical Diseases of the Colon and Rectum."——Drs. Herbert W. Harris and Martin Batts Jr., both of Ann Arbor, discussed infected compound fractures and bone tumors, respectively, before the Kalamazoo Academy of Medicine, May 21.——Dr. Edward R. Krumbiegel, Milwaukee, discussed "Pertinent Points in Diagnosis, Prophylaxis and Treatment of Contagious Diseases" before the Muskegon County Medical Society, May 17.——Dr. Clifford H. Keene, Ann Arbor, discussed "Management of the Cancer Patient" before the Genesee County Medical Society in Flint, April 24.

MINNESOTA

Awards for Research.—The John and Mary R. Markle Foundation has given $3,600 to support studies of the significance of the excretion of various porphyrins by Dr. Cecil J. Watson, associate professor and director of the division of internal medicine, University of Minnesota Medical School. Dr. Arthur T. Henrici, professor of bacteriology and immunology, has received a grant of $500 from the National Tuberculosis Association for an investigation of the acid-fast actinomyces in relation to tuberculosis. Dr. Charles E. McLennan, instructor of obstetrics and gynecology, University of Minnesota Medical School, Minneapolis, has been awarded a fellowship by the Commonwealth Fund for a year's study with Dr. Eugene M. Landis, professor of internal medicine, University of Virginia Department of Medicine, Charlottesville, on problems concerning the toxemias of pregnancy.

Society News.—Dr. Erling W. Hansen, Minneapolis, was elected president of the Minnesota Academy of Ophthalmology at a meeting in Minneapolis, April 12; other officers include Drs. William A. Kennedy, St. Paul; Theodore R. Fritsche, New Ulm, vice presidents, and George E. McGeary, Minneapolis, secretary-treasurer.——Dr. Raymond W. McNealy, Chicago, addressed the St. Paul Surgical Society, April 11, on "Perforation in Peptic Ulcer: A Critical Review in 700 Cases."——Among others, Dr. Russell R. Hendrickson, Wabasha, discussed "Diagnosis of Tuberculosis" before the ninth annual joint meeting of the Winona and Wabasha County Medical societies and the fifteenth annual dinner given by the Buena Vista Sanatorium Commission to the physicians of the counties, April 8, in Wabasha.——Dr. Orwood J. Campbell gave the president's address before the Minnesota Pathological Society, Minneapolis, May 21, on "Hyperinsulinism."

MONTANA

Personal.—Dr. Earl S. Porter, Lewistown, has been appointed a member of the state board of medical examiners for a term ending Feb. 10, 1947. He succeeds Dr. Arter W. Deal, Lewistown, who was not a candidate because of illness.——Dr. Ferdinand R. Schemm, Great Falls, addressed the Mount Powell Medical Society, April 15, on "The Management of Edema in Heart and Kidney Diseases."

State Medical Meeting in Bozeman.—The Montana State Medical Association will hold its annual meeting in Bozeman, June 19-20, under the presidency of Dr. Harold W. Gregg, Butte. The following members of the staff of the University of Minnesota Medical School, Minneapolis, will offer the scientific program:

Dr. Nathaniel Logan Leven, (1) Problems in Biliary Tract Surgery, (2) Skin Transplantation.
Dr. Walter A. Fansler, (1) Diagnosis and Treatment of Carcinoma of Bowel, (2) Office Treatment of Anorectal Disease.
Dr. William A. O'Brien, (1) Cause and Prevention of Newborn and Premature Deaths, (2) Changes in Morbidity and Mortality Problems Incident to Aging of the Population.
Dr. Cecil J. Watson, (1) Treatment of Heart Failure, (2) Jaundice Considered from the Standpoint of Diagnosis and Pathologic Physiology.
Dr. Ernest M. Hammes, (1) Craniocerebral Injuries, (2) Modern Treatment of Psychiatric Disorders.

NEBRASKA

Courses in Obstetrics and Pediatrics.—The Nebraska State Medical Association and the division of maternal and child welfare of the state health department cooperated in presenting three weeks of courses in obstetrics and pediatrics in April. The lectures in obstetrics were given by Dr. Morris Edward Davis, associate professor of obstetrics and gynecology, the School of Medicine, Division of Biological Sciences, University of Chicago, and those in pediatrics by Dr. Moses Cooperstock, assistant professor of pediatrics and infectious diseases, University of Michigan Medical School, Ann Arbor. Two groups of towns were the centers for instruction: one including Columbus, Pender, Norfolk, O'Neill and Ainsworth; the other, Nebraska City, Beatrice, York, Hastings and Kearney.

NEW JERSEY

Personal.—Dr. Harold E. Longsdorf, Mount Holly, recently received a citizenship award for "meritorious service in the field of public health," presented by the Mount Holly Service Club.

Society News.—The Cape May County Medical Society held a joint meeting and banquet with the Cape May County Bar Association, April 11, with Dr. Edward G. J. Beardsley, Philadelphia, and Hon. Allen B. Endicott, Atlantic City, president of the state bar association, as guest speakers.——A program on "Clinical Aspects of Pulmonary Disease" was presented before the Essex County Medical Society, Newark, April 11, by Drs. George G. Ornstein, James B. Amberson Jr. and Harry Wessler, New York, and William F. Rienhoff Jr., Baltimore.——Dr. Perrin H. Long, Baltimore, addressed the Hudson County Medical Society, Jersey City, recently, on "Clinical Evaluation of the Therapeutic Effects of Sulfanilamide, Neoprontosil, Sulfapyridine and the Sulfathiazoles."

NEW YORK

Lectures on Physical Therapy.—The council committee on public health and education of the Medical Society of the State of New York sponsored a course of lectures in physical therapy for St. Lawrence County Medical Society, Ogdensburg, and the Jefferson County Medical Society, Watertown. The speakers were:

Dr. Richard Kovacs, New York, The Therapeutics of Heat; Medical and Surgical Diathermy; Physical Therapy in Arthritis, April 18.
Dr. William Bierman, New York, Therapeutic Use of Ultraviolet Radiation; Physical Therapy in Medical Conditions, April 25.
Dr. Kovacs, Galvanic and Low Frequency Currents; Electrodiagnosis; Physical Therapy in Gynecology, May 2.
Dr. Kristian G. Hansson, New York, Physical Therapy in Traumatic Conditions, May 16.

Foundation Established to Extend Psychotherapy to Patients of Moderate Means.—The Lake George Foundation, Inc., was established recently for the purpose of aiding in the extension of medical care and occupational therapy to patients of modest means suffering from maladjustments and psychosomatic disorders, it is announced. The foundation will work in close cooperation with Tratelja Farms, Diamond Point on Lake George, which was established in 1938 and will assist in the development of mental hygiene and child guidance clinics in the neighboring city of Glens Falls. Officers of the foundation are Mr. Henry E. H. Brereton, Diamond Point, president; Drs. John A. P. Millet, New York, and Daniel Blain, New Canaan, Conn., vice presidents; Mr. Laurence Millet, New York, secretary, and Mrs. Henry E. H. Brereton, Diamond Point, treasurer. Funds donated to the foundation will be administered by a board of trustees selected from persons prominent in civic affairs, social work and business administration both in the local community and in distant cities, according to the announcement.

New York City

Clinical Conference for Medicomilitary Officers.—The Metropolitan New York chapter and the New Jersey chapter of the Association of Military Surgeons of the United States will hold a clinical conference for medicomilitary officer personnel at the U. S. Marine Hospital, Stapleton, June 22. There will be general inspection and ward rounds and case presentations on miscellaneous subjects. All officers and prospective officers of the medical departments of the armed forces of the United States are invited to attend.

Reunion of Premature Babies at Exposition.—Plans have been announced for a reunion June 14 of the babies cared for at the 1939 New York fair in the station for incubator babies directed by Dr. Martin A. Couney. Forty-three babies will be brought by their parents. Each baby will be given a silver cup carrying its name and the insignia of the fair. A certificate signed by Dr. Couney and the president of the fair stating that the baby gained its start in life at the incubator station at the 1939 exposition will also be presented. Five babies in the original group of fifty died. Of the five who died, three arrived in a hopeless condition. Of the forty-five surviving babies, one returned with its parents to Argentina, the father having been a representative of that government to the fair. The other has congenital hip disease and cannot be transported. There were thirty-six female babies in the original group and fourteen males. The average age was 9.5 days, ages ranging from 1 to 67 days. Of the seven weighing on admission under 1,000 Gm., five are now living and two are dead; of the twenty-five between 1,000 and 1,500 Gm., twenty-two are living and three dead; of the thirteen between 1,500 and 1,700 Gm. and the five between 1,700 and 2,000 Gm., all are living. An exhibit of *Hygeia* and its work in public education was a feature of the station last year and is installed again this year.

OHIO

Cleveland Health Agencies Plan Coordination of Efforts.—Public and private health agencies have recently formed an "Advisory Committee on Health and Hospitals in Greater Cleveland," headed by Mayor Harold H. Burton, James A. Reynolds, president of the board of county commissioners, and Dr. Robert H. Bishop Jr., director of University Hospitals, with Edward D. Lynde, executive secretary of the Welfare Federation of Cleveland, as secretary. Under this directing group the committee was subdivided into a committee on health and one on hospitals. The committee on health will make a study of health services and of the laws relating to them, recommend revisions that will end wasteful duplication, fix responsibility, simplify procedure and otherwise minimize the cost of and improve health service, and finally, develop a five year (or longer) program with special emphasis on disease prevention and health education. The committee on hospitals will do the same for hospitals, laying emphasis on the provision of adequate facilities in a community that makes more and more use of its hospitals. Dr. James A. Doull, professor of public health and hygiene at Western Reserve University School of Medicine, will be general consultant and ex officio member of both committees and Dr. Lyman F. Huffman, chairman of the public health committee of the Cleveland Academy of Medicine, will be ex officio member of both committees.

OREGON

Faculty Appointment.—Dr. William Y. Burton, St. Louis, has been appointed assistant professor of radiology at the University of Oregon Medical School, Portland, effective July 1. Dr. Burton graduated from Washington University School of Medicine, St. Louis, in 1936.

Internal Medicine Society Meeting.—The North Pacific Society of Internal Medicine met in Portland, April 13, with members of the faculty of the University of Oregon Medical School as guest speakers. They included Dr. Warren C. Hunter on the occurrence of thrombosis in the veins of the legs; Dr. Hance F. Haney, accelerator fibers in the vagus nerve; William B. Youmans, Ph.D., physiology of the small intestine; Wilbert R. Todd, Ph.D., biochemical studies in calcium metabolism, and Dr. Robert S. Dow, use of the oscillograph in neuro-anatomy.

Society News.—Drs. Thomas A. McKenzie and William B. Neal addressed the Lane County Medical Society, Eugene, April 19, on "Some Gastro-Intestinal Problems" and "Injection Treatment of Hernia" respectively.——Dr. Lyle B. Kingery, Portland, addressed the Mid-Columbia Medical Society, Hood River, April 23, on "Superficial Mycotic Infection of the Skin."——Dr. Howard P. Lewis, Portland,

addressed the Polk-Yamhill-Marion Counties Medical Society, Salem, April 9, on "Subacute Bacterial Endocarditis and Brucellosis." ——At a meeting of the Umatilla County Medical Society, Pendleton, April 9, the guest speaker was Dr. James M. Odell, The Dalles, on "Differential Diagnosis in the Problem of Pulmonary Tuberculosis."

PENNSYLVANIA

Society News.—Drs. John S. Packard, Allenwood, and Esmond R. Long, Philadelphia, addressed the Lycoming County Medical Society, Williamsport, May 10, on "Diagnosis and Treatment of Tuberculous Tracheobronchitis," and "Tuberculin Test and X-Ray in Tuberculosis Case Finding" respectively. ——Dr. Joshua Montgomery Deaver, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, May 14, on "Surgical Management of Diseases of the Rectum and Colon." ——Dr. Lawrence W. Smith, Philadelphia, addressed the Cambria County Medical Society, Johnstown, May 9, on "Refrigeration as an Adjunct to the Treatment of Cancer."

Philadelphia

Osler Memorial Building.—The Old Autopsy House at Philadelphia General Hospital has been restored and will be dedicated, June 8, as the Osler Memorial Building. The occasion will mark the premier showing of the painting "Osler at Old Blockley" by Dean Cornwell.

Pittsburgh

Emmerling Lecture.—Dr. Tinsley R. Harrison, associate professor of medicine, Vanderbilt University School of Medicine, Nashville, Tenn., delivered the Drs. Charles and Karl Emmerling Memorial Lecture at the headquarters of the Pittsburgh Academy of Medicine, May 13. His subject was "Newer Phases of Management of Hypertension."

VIRGINIA

New Hospital Buildings.—Dedication of new buildings for the Lynchburg General Hospital was held May 21. The Hon. Clifton A. Woodrum, Roanoke, Congressman from the sixth district, made an address in the afternoon and in the evening Dr. Wilburt C. Davison, dean of Duke University School of Medicine, Durham, N. C., delivered an address on "Opportunities in the Practice of Medicine."

Postgraduate Course on Internal Medicine.—The department of internal medicine of the University of Virginia School of Medicine, Charlottesville, will conduct a postgraduate course on recent advances in internal medicine, June 17-22, under the auspices of the department of clinical and medical education of the Medical Society of Virginia. Members of the faculty will be the instructors.

WASHINGTON

New Health Officers.—Dr. Cecil R. Fargher, Wenatchee, recently health officer of Chelan County, has been appointed health officer of Clark County, succeeding Dr. John A. Kahl, Vancouver. Dr. George R. Kingston, Walla Walla, recently health officer in Walla Walla County, has been appointed in Chelan County and Dr. Harold M. U'Ren, Spokane, succeeded him in Walla Walla. Dr. William A. Johnson, formerly of Tacoma, has been appointed in Cowlitz County.

Society News.—Dr. Max Pinner, New York, addressed the King County Medical Society, Seattle, April 22, on "The Practitioner's Role in Tuberculosis Work" and Dr. Harold E. Nichols, Seattle, reported on the work of the Anti-Tuberculosis League of King County. Dr. Alfred A. Strauss, Chicago, was the speaker, May 6, on "Ileostomy and Its Use in Surgery of the Colon."——Dr. Verne C. Hunt, Los Angeles, was the guest speaker at an all day meeting of the Spokane Surgical Society, April 27, presenting several papers and discussions.

WISCONSIN

Women's Field Army Honors Dr. Sleyster.—The Wisconsin unit of the Women's Field Army of the American Society for the Control of Cancer sponsored a dinner in honor of Dr. Rock Sleyster, Wauwatosa, President of the American Medical Association, April 19, at the Hotel Schroeder, Milwaukee. Dr. Frank L. Rector, Evanston, Ill., representative of the American Society for the Control of Cancer, was the principal speaker on "Why Women Fight Cancer." Other speakers were Drs. Raymond G. Arveson, Frederic, president of the State Medical Society of Wisconsin, and Charles Fidler, Milwaukee.

GENERAL

Society News.—The American College of Radiology will hold its annual meeting at the Commodore Hotel, New York, June 12, with Dr. Irvin Abell, Louisville, Ky., as the principal speaker. The business session will be followed by a banquet and an address by Dr. Frederick M. Hodges, Richmond, Va. ——The Associated State Postgraduate Committees will hold its fourth annual meeting at the Shelton Hotel, New York, June 12.

Meeting of Food Technologists.—The first meeting of the Institute of Food Technologists will be held at the Morrison Hotel, Chicago, June 17-19. The program will offer symposiums on food engineering and on the influence of processing on vitamin content. The third day will be devoted to visits to food manufacturing plants in Chicago. The institute was organized in Cambridge, Mass., in July 1939 following the second conference on food technology, held under the auspices of the Massachusetts Institute of Technology. Samuel C. Prescott, Sc.D., at the Massachusetts Institute, is president; Roy C. Newton, Ph.D., chief chemist, Swift and Company, Chicago, vice president, and George J. Hucker, Ph.D., New York State Agricultural Experiment Station, Geneva, secretary.

Lowest Infant Mortality Rate.—The Bureau of the Census recently issued statistics on the infant mortality rates for 1938, with comparisons of rates in previous years. The general rate for continental United States in 1938 was 51, the lowest since the birth registration area was established in 1915 and undoubtedly the lowest in the history of the country, the bureau states. In 1916 and 1918 the rate was above 100 deaths per thousand live births. Connecticut had the lowest rate, 36.3, and six other states had rates under 40: Massachusetts, Minnesota, Nebraska, New Jersey, Oregon and Washington. The highest rate in 1938 was 108.7 in New Mexico; the 1930 rate for New Mexico, however, was 145. Other high rates were reported in the following states: Arizona, 98.8; Georgia, 67.7; Louisiana, 67.1; North Carolina, 68.6; South Carolina, 80.3; Virginia, 66.2. Most of these represent considerable reductions from previous years, however, the report shows.

Reunions.—A dinner of the Federation of Catholic Physicians' Guilds will be held at the Biltmore Hotel, New York, Wednesday, June 12. Mr. Lorenz Brosnan, New York, counsel for the Medical Society of the State of New York, and the Rev. Ignatius Cox, S.J., the national moderator of the guilds, will be among the speakers. At 9 a. m. His Excellency Most Reverend Francis J. Spellman, archbishop of New York, will celebrate a mass in the Lady Chapel of St. Patrick's Cathedral for the members of the guilds; at 11 o'clock there will be a meeting of the executive committee of the federation of Catholic Physicians' Guilds at the Waldorf-Astoria Hotel in the club rooms of the Catholic Club on the seventeenth floor. These club rooms will also be used as general headquarters for all members of guilds of other states who wish to avail themselves of the hospitality of the Catholic Club during the American Medical Association convention.——A reunion of former interns and visiting physicians of the Children's Medical Service of Bellevue Hospital will be held at the hospital, Tuesday, June 11. Inspection of the service in the early afternoon will be followed by a general meeting at 4:30. A supper will be served later in the Students' Lounge of New York University Medical College. All former staff members are invited.

CANADA

Canadian Medical Association Meeting.—The seventy-first annual meeting of the Canadian Medical Association will be held in Toronto, June 17-21, at the Royal York Hotel, under the presidency of Dr. Frank S. Patch, Montreal. Among speakers who will address general sessions will be:

Dr. Edmund P. Fowler, New York, The Course and Prognosis of Otitis Media Under New and Old Methods of Treatment.
Dr. Joseph Gardner Hopkins, New York, Urticaria.
Dr. James H. Means, Boston, The Diagnosis and Treatment of Hyperthyroidism.
Dr. James D. Adamson, Winnipeg, Man., Clinical Significance of Bronchial Obstruction.
Dr. John H. Couch, Toronto, Treatment of Injuries and Infections of the Hand.
Dr. Wilfred Alan Curry, Halifax, N. S., Intestinal Obstruction.
Dr. William Fulton Gillespie, Edmonton, Alta., Acute Abdominal Pain.
Dr. Jonathan C. Meakins, Montreal, Shock: Its Recognition and Treatment.
Dr. George Gavin Miller, Montreal, Subtotal Resection for Peptic Ulcer.
Dr. Ray F. Farquharson, Toronto, Anorexia Nervosa.

At the first general session Dr. Patch will deliver his presidential address and Dr. Alan C. Brown, professor of pediatrics, University of Toronto Faculty of Medicine, will deliver the Blackader Lecture.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 3, 1940.

Lectures for Canadian Medical Officers

The earl of Athlone, governor-general designate of Canada, visited the Middlesex Hospital, London, to meet a group of Canadian medical officers who are attending a course of lectures there. When the first Canadian troops reached this country a series of day-long postgraduate lectures was arranged for 100 of the medical officers by the Middlesex Hospital, whose action they greatly appreciate. Apart from the practical value of the lectures and demonstrations, the courses have given an opportunity for social intercourse and have brought together doctors who have not met since their student days. Lord Athlone, who is a former chairman of the hospital board, the members of the board and the hospital staff met a group of forty Canadian medical officers who were in charge of Colonels R. M. Luton and J. A. Linton.

Substitute for Cod Liver Oil

British production of cod liver oil is almost stopped because most of the trawlers of the industry are in the service of the navy and imports of Norwegian oil have ceased. Up to the beginning of April imports were on a large scale, so that there is no immediate scarcity; but it is necessary to husband supplies. As a wartime substitute it has been decided to add to the British Pharmacopeia an oil expressed from the seeds of Arachnis hypogoea, a native of Brazil, which is now extensively cultivated in India, West Africa, China and America. This oil has properties similar to those of olive oil. It will be vitaminized by addition of vitamins A and D to the standard of a good average specimen of the oil expressed from the fresh liver of the cod, Gadus morrhua. The addition to the pharmacopeia will embody a formula which will become a legal standard under the food and drugs act, with which venders must comply in the sale of "medicinal" cod liver oil for human use as distinct from "veterinary" cod liver oil. For the latter there is already an official substitute sanctioned by the Ministry of Food. It consists of a mixture of cod liver oil of high vitamin potency and marine oil.

Imperial Cancer Research Fund

At the annual general meeting of the Imperial Cancer Research Fund Mr. Hugh Lett, president of the Royal College of Surgeons, said that the work of the fund began in 1902 for the purpose of fundamental research on the nature and causes of cancer. Cancer research had been made a general biologic investigation. This policy had placed the fund in a high position scientifically which was recognized in every civilized country. One great advance was the final determination by Bashford and Murray that cancer was at first purely a local condition originating in a group of cells. Cancer research had expanded beyond all expectation. It had been shown that cancer could be caused by application of certain pure chemical substances or physical agents. Therefore some forms could be prevented by appropriate precautions. A recent development was the evidence that hormones might be a decisive factor in the genesis of cancer of the breast.

In the annual report of the fund W. E. Gye, director of the scientific staff, points out that the study of the induction of new growths by application of chemical substances now forms a large part of cancer research. The demonstration that malignant new growths can be induced in almost any part of the body proves that the occurrence of some cancers, at least, is related to environment, which can be controlled, and is not entirely dependent on some mysterious uncontrollable inborn peculiarity. This aspect of carcinogenesis has occupied the attention of the fund's scientific staff for several years.

Repeated applications of carcinogenic chemical substances produce epithelial hyperplasia and hypertrophy of skin. These changes are not specific but are common to many chronic and healing lesions due to different causes. Yet it is probable that the substances which induce cancer injure the tissues in a peculiar way. Polycyclic hydrocarbons, which are carcinogenic, evoke a characteristic reaction on the second to fourth day after application. Cells and their nuclei swell and cytoplasm becomes vacuolated. Multiplication of cells follows; the increase of cells and nuclei is progressive. Cytoplasmic degeneration appears in some of the cells, while others show signs of recovery. Chemically related noncarcinogenic hydrocarbons do not evoke the reaction.

TUMORS CAUSED BY FILTRABLE VIRUSES

It is only in filtrable tumors that antigenic agents have been found which are not normal constituents of the animal body. These agents, the viruses, are being investigated with great care. Two spontaneous sarcomas were transmitted by filtrates of the original tumors. Transmission of a spontaneous sarcoma by filtrate has not been previously recorded. One of the sarcomas occurred in a fowl which had never been in contact with experimental tumors. These observations controvert the suggestions which have been made that the filtrability of fowl sarcomas is acquired during transplantation or is a result of contamination by the filtrable agent of Rous sarcoma I. A sarcoma which originated near the site of implantation of a transplantable sarcoma was transplanted and subsequently transmitted by filtrates. This transplantation by filtrates contrasts with consistent failures in the laboratory to transmit, in the same way, sarcomas induced in fowls by carcinogenic agents.

PARIS

(From Our Regular Correspondent)

May 4, 1940.

Health of Colonial Recruits

Physician-General Blanchard discussed before the Academy of Colonial Sciences the sanitary measures employed on the occasion of the arrival in France of large numbers of men recruited from the French colonies of Asia, Africa and Oceania as soldiers and workers. Above all, the outbreak of infectious diseases had to be prevented among such diversified and susceptible groups. They had to be protected, he said, against their new pathologic environment as the native French must be against the dangers to health of which the former were the possible carriers. Their physical and moral health had to be maintained in the best condition and their selection carefully supervised. Shifts of men on a large scale with change of climate, environment and food constitute conditions favorable to endemics. Since 1938, in anticipation of the arrival of the colonials, health measures had been prepared. Dispensaries had been founded in the colonies, well equipped with prophylactic remedies and possessing important reserves of medicaments and materials. Djibouti on the Red Sea, for example, as well as Dakar on the Atlantic Ocean had been supplied with the personnel and material necessary for the sanitary control with which these centers might eventually be charged. The outbreak of the war proved the efficacy of the measures taken. The antiplague vaccines of the Pasteur Institute of Tananarive, the anticholera vaccines of the Pasteur Institute of Indo-China and the antiamaril vaccines (for yellow fever) of the Pasteur Institute of Dakar deprived these diseases of their local menace as well as that due to importation. The pneumococcus, to which the colonial natives were susceptible and which had aroused grave anxieties during the war of

1914-1918, had been completely guarded against by an ensemble of sanitary measures pertaining to clothes, transportation, antipneumococcus vaccination and the regular use of sulfapyridine. Though cerebrospinal meningitis had acquired a disquieting spread in the tropical zone and the Far East, nevertheless recruits had to be drawn from these regions. Accordingly, antimeningococcus vaccination and sulfonamide therapies were added to the former methods employed in the search for germ carriers and for buccopharyngeal sterilization. Ten million tablets sent by air enabled the carrying out, on an unprecedented scale, of prophylaxis. Necessary supplies against dysentery were on hand. Trachoma, leprosy, trypanosomiasis and venereal diseases had been provided against. Thymol and oil of chenopodium assured against parasites in the intestine. The danger of tuberculosis was guarded against by the systematic examination of the recruits and by inoculation with BCG vaccine by scarification. This huge program of curative and prophylactic sanitation was conducted in close cooperation with British sanitary staffs.

Hypersensitiveness to Postoperative Infection

Postoperative deaths from infection often occur in spite of the fact that the results of surgical intervention were favorable and the patient was well examined and prepared. The symptoms that precede death are high fever, a positive blood culture and the evidence of the bone marrow at necropsy. The impression created is that of an abnormal reaction of the individual. The edematous condition of the lung suggests an anaphylactic shock, a view supported by hematemesis, hematuria and intestinal infarcts. According to Jean Louis Lortat-Jacob, the hypersensitiveness that seems to be at the bottom of these accidents might be "the form that is intolerant of immunity." Hypersensitiveness not only is determined by albuminoid substances or serums but is observed likewise in the presence of infectious germs. Lortat-Jacob recently submitted multiple proof in a significant experimental study.

Immunity and hypersensitiveness are opposed to each other but yet capable of succeeding each other in the same person. Every individual that is a carrier of germs or is hypersensitive may, under certain conditions, become the seat of grave manifestations of hypersensitiveness to infection, specific or nonspecific. As Reilly has demonstrated, the vegetative nervous system plays a preponderant part. Clearcut vagotonia ought to be considered as favorable to reactions of hypersensitiveness. This vagotonia should be determined by the investigation of the oculocardiac reflexes, by atropine or by intradermal reactions with polyvalent vaccines. Preventive and curative therapy consists in stimulating the sympathetic nerve and avoiding acidosis rather than in insisting on vaccinations, which should be reserved for subjects presenting a positive intradermal reaction. Surgical intervention is performed only when intradermal reactions have become negative.

Erythroblastosis

Besides erythroblastic syndromes such as those of cancer and tuberculosis of the spleen, one observes more and more pathologic conditions characterized by a "dysgenic hyperplasia of the bone marrow" that involve cryptogenic processes. The latter are not always accompanied by lesions or hepatosplenic symptoms but are often limited to foci of erythroblastic myeloid metaplasia. Professor Pittaluga of Madrid reported to the French society of hematology a case of grave anemia with fever and subicterus, enormous increase in the size of the spleen and liver, profound disturbances of water and fat metabolism and progressive decrease of erythrocytes of hyperchromatic tendency but without megalocytosis, with leukopenia and an increasingly pronounced erythroblastosis that dominated the pathologic picture until death set in. This case, minutely studied with the aid of laboratory technics, gave Pittaluga an opportunity to elaborate his views on erythroblastosis and its diagnosis. There is a difference, he said, between erythroblastic and reticulocytic reactions. Reticulocytes do not obey the same factors as erythroblasts. Cryptogenic erythroblastosis in adults presents a pathologic background, with simultaneous lesions of the myeloid blood system, spleen and liver and metabolic alterations. These changes are polymorphic and regularly associated with massive and persistent erythroblastosis. The etiology of this disease may be infectious, since a number of symptoms point in that direction. However, the blood culture is negative. The causative agent may also be sought in deficiency of nutrition, of vitamin assimilation and of the assimilation of certain primary groups of food substances, to which constitutional factors point. Intoxication may also be responsible. Dysfunction in the assimilation of the vitamins, notably of B_6, of A and of D, is probable. Among intoxications tar derivatives have been suspected. Constitutional factors, however, cannot be excluded; etiologically blood diseases must be referred to these factors. Several blood diseases, the speaker said, were due to constitutional disorders and had their root in a morbid heredity. Accordingly, essential erythroblastosis must be considered a hereditary disease that is belatedly activated perhaps by an accidental infection. It involves a profound and complex biochemical and physiochemical change of remote origin and has a fatal prognosis.

BERLIN

(From Our Regular Correspondent)

April 26, 1940.

Midwives, Nurses and Nurse Maids

A sharper distinction is to be drawn hereafter between midwives, nurses and nurse maids. Nurses as well as nurse maids may not be officially certified as midwives, and vice versa. Certification as a midwife automatically cancels certification as regular nurse or child nurse. There is, however, nothing to prevent change from one of these occupations to the other. Nurses may not take over a maternity case or the care of a healthy newborn infant if they have handled a regular case three days previously. Neither may a nurse take over the case of a healthy lying-in woman until ten days have elapsed after delivery. The training of nurse maids (Säuglings- und Kinderschwester) has likewise been reorganized. In addition to a satisfactory examination, evidence must be presented of Aryan descent and political reliability. After the examinations, the nurse must serve six months in public welfare work and in a children's clinic. To be eligible for training the applicant must be 18 years old and have spent one year in domestic service in a family, an institution or a school. The training lasts one and one-half years and requires a state examination. The title of child nurse is legally protected against fraudulent use.

Midwives may hereafter exercise their occupation until they reach the seventieth year. Prolongation of service may be officially granted in exceptional cases, conditioned on physical and mental vigor.

Rabies

According to a report of the department of the interior, rabies is prevalent in the eastern sections of present Germany. Regulations have been adopted for its control and the education of the population. For this an educational film is used. Dogs appearing in public must be kept on the leash.

Malformations

A new order of the department of the interior requires that malformed infants be reported to the respective board of health. These deformities include idiocy and mongolism, especially in combination with blindness and deafness, microcephalus, grave or progressive hydrocephalus, and malformations of all kinds.

BUENOS AIRES

(From Our Regular Correspondent)

April 26, 1940.

Tuberculosis Control

Recently in these columns information was given pertaining to the control of tuberculosis (THE JOURNAL May 4, p. 1822). According to a report for the city of Buenos Aires covering the year 1939, by Dr. A. A. Raimondi, the number of beds in the municipal tuberculosis hospitals has not been increased in accordance with existing needs. In 1939, 2,794 persons died of tuberculosis, 1,664 men and 1,130 women. However, the mortality rate for tuberculosis has greatly decreased during the last decade. Visits were made in 2,463 homes in which death from the disease had occurred. Of 609 children exposed to the infection 263 were found diseased. Numerous organizations in Buenos Aires are engaged in promoting and extending the control of tuberculosis.

Hookworm Disease

In 1924 a service bureau of the national department of public health was organized in Corrientes, the province most affected with hookworm disease. In 1934 a law was passed making treatment and prophylaxis compulsory in Argentina. Those suffering from the disease and unable to prove that they are under private treatment are treated without charge at the government stations. Under certain conditions patients may be isolated in their homes. Hygienic regulations have also been prepared for homes and factories.

Two Argentine gunboats have been fitted out with laboratories for scientific tests to be made by a commission headed by Dr. Carlos Fonso Gandolfo, professor of infectious diseases in Buenos Aires, and consisting of a staff of more than twenty physicians and eighty student helpers to undertake an investigation of the infection. This investigation is to last two weeks. For the duration of this investigation, twenty additional laboratories will be set up. In addition, lectures, films and illustrated printed material will be used to educate the population. This investigation has the support of the responsible health boards and of the army and navy, and much is expected from it. The national health board treated 36,700 persons in these regions during the last year. Lack of cooperation on the part of the population and laxness in enforcing existing penalties have interfered with the degree of disease control desired.

Congress of Otorhinolaryngologists

The Congress of Otorhinolaryngologists, the first of its kind, took place in Buenos Aires, April 21-25. Its origin goes back to a suggestion advanced in 1938 by Brazilian specialists meeting in Rio de Janeiro. Dr. Eliseo V. Segura, professor of otorhinolaryngology in Buenos Aires, presided. Official delegations of Brazil, Chile, Peru, Uruguay and Venezuela participated. The papers discussed infections of the accessory nasal cavities and their treatment, conservative surgery of the middle ear, otorhinolaryngologic localization of blastomycosis, and the physiopathology of the inferior portion of the labyrinth. Two surgical sessions were also conducted with practical demonstrations by visiting surgeons. Professor Segura pointed out that South American medical science had come into its own and could give an account of itself in contributing independently to the progress of medicine, free from the tutelage of Europe. The congress was well attended. The next congress will meet three years hence in São Paulo, Brazil, with Prof. de Paula Santos as its presiding officer.

Nutrition in Chile

An investigation on nutrition was conducted in Chile by Carlo Dragoni and Etienne Burnet, an expert on hygiene from the League of Nations, among 593 families involving 3,383 persons (*Revista chilena de higiene* **1**:409 [Oct.-Dec.] 1938). Forty-one per cent of these families lived in Santiago de Chile. Expenditures for food represented 78.3 per cent of the total expenditures. In general, wages paid in many of the large mining, textile and construction industries, the report indicates, permit a standard of living on a modest and sufficient scale. In the small industries, trades and small business, however, living conditions are largely unsatisfactory. Four meals a day are customary. For breakfast a warm beverage is always served, such as coffee, tea and mate together with bread. Butter is rarely used. The afternoon repast has not the same significance as breakfast and consists likewise of a warm beverage and bread. The same types of food are represented in the two principal meals. In 43 per cent of the meals the cazuela, the national dish consisting basically of meat and fish, is found. A comparative analysis showed that more meals had a meat basis than a vegetable basis, such as beans and potatoes (7,454 vs. 4,971). Beverages mostly in use are tea and sugared coffee. The use of wine is rare. An adequate or plentiful nutritional status was found in 180 of the 593 families, comprising 924 persons. In 131 (764 persons) it was just sufficient; 280 families (1,689 persons) were more or less underfed. Hence, according to this investigation, half of the average population suffer from malnutrition. According to the principles set up in London by the conference on nutrition of the League of Nations, the so-called protective foods should constitute the basis, and cereals and sugar should be regarded as supplementary energy foods. In Chile the old nutritional conceptions still prevail.

Personals

Prof. Bariano R. Castex, professor of internal medicine, succeeded Dr. Alberto Peralta Ramos, professor of gynecology, as president of the Academy of Medicine in Buenos Aires.

Dr. Nicanor Palacios Costa, professor of gynecology, succeeded Prof. José Arce, retiring professor of surgery, as dean of the medical faculty in Buenos Aires.

Dr. Enrique Castano was appointed professor of clinical urology in Buenos Aires in place of Professor Maraini, who recently died. Dr. Atilio J. Costa was named professor of surgical technics in place of Prof. Bosch Arana, deceased.

Dr. José A. Saralegui, associate professor of the faculty of medicine, was appointed director of the municipal institute of radiology and physical therapy in Buenos Aires. He has studied in the United States.

Prof. Ramón Doria was appointed dean of the medical faculty in Asunción, Paraguay.

Marriages

EDWARD MARSHALL SANDIDGE, Pleasant View, Va., to Miss Nellie Penn McDaniel of Sandidges, April 3.

ERNEST LYNWOOD BAGBY to Miss Barbara Lucille Riddell, both of Richmond, Va., April 27.

LOUIS BENJAMIN SHEPPARD to Miss Callie Helen Nolde, both of Richmond, Va., April 25.

KENNETH B. WALBORN to Miss Annie Evangeline Pool, both of Dallas, Texas, March 24.

LEOPOLDO E. LOPEZ to Miss Edith Gil Santana, both of Caracas, Venezuela, May 11.

FRANK SAMUEL GRIFFIN JR., Liberty, Texas, to Miss Helen Shattuck of Alto, March 10.

DONALD HARPER LEEPER JR. to Miss Fofo Mezitis, both of Washington, D. C., in April.

LEWIS ALEXANDER VANCE, Boston, to Miss Jane Kelley of Brookline, Mass., April 20.

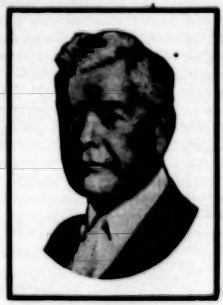
HUGH H. TROUT JR. to Miss Elizabeth Page Broun, both of Roanoke, Va., April 6.

E. J. TUCKER JR., Liberty, Texas, to Miss Lola Dickson, March 10.

Deaths

Charles Benjamin Wright ● member of the Board of Trustees of the American Medical Association, died at his home in Minneapolis, May 31, of myocarditis and emphysema, aged 63.

Dr. Wright was born Nov. 3, 1876, in Kemptiville, Ontario. With his parents he moved to Grand Forks, N. D., and was graduated from the University of North Dakota in 1898, at which time he was a star on the University of North Dakota football team. He then entered the medical department of Johns Hopkins University, receiving his degree in medicine in 1902 and becoming house officer at the Johns Hopkins Hospital. After graduate study abroad in Vienna, Berlin and Rome in 1913 and 1914 he became associate professor of medicine at the University of Minnesota Medical School from 1920 to 1935 and had been professor of clinical medicine since 1935.



CHARLES B. WRIGHT, M.D., 1876-1940

He was a fellow of the American College of Physicians and member of the Central Society for Clinical Research and also a member of the Societies of Internal Medicine and of Pathology in Minnesota. He had from time to time published scientific contributions on rectal bleeding, histamine, undulant fever and microcytic anemia.

Early in his career Dr. Wright became interested in the work of organized medicine, serving as a member of the House of Delegates of the American Medical Association as a representative from Minnesota, from 1930 through 1933. In that year he was elected a member of the Board of Trustees for a term of five years and was reelected for another five year term in 1938. At the time of his death he was chairman of the Executive Committee of the Board.

Dr. Wright was devoted to the work of the American Medical Association, giving unstintingly of his time and his thought to the numerous problems which have concerned the profession in recent years. His loyalty, his impatience with deceit and his aggressiveness on behalf of a free medical profession made him distinguished as a leader.

Joseph Elzear Lamoureux, Lowell, Mass.; Laval University Faculty of Medicine, Quebec, 1893; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1893; member of the Massachusetts Medical Society; formerly chairman of the school committee; on the staff of St. Joseph's Hospital; aged 70; died, March 16, of carcinoma of the throat.

Frederic Bertrand, Sherbrooke, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1905; Laval University Faculty of Medicine, Quebec, 1906; fellow of the American College of Surgeons; on the staff of Hôpital General St. Vincent de Paul; aged 58; died, February 9, of myocardial infarction.

Harold Philipp Kuhn ● Kansas City, Mo.; University of Kansas School of Medicine, Kansas City, 1906; fellow of the American College of Surgeons; professor of oral surgery, Kansas City-Western Dental College; attending surgeon to St. Luke's and Kansas City General hospitals; aged 59; died, April 15, of malignant hypertension and chronic nephritis.

James Thomas Jeter, Santuck, S. C.; Medical College of the State of South Carolina, Charleston, 1890; member of the South Carolina Medical Association; formerly member of the state senate; served during the World War; aged 72; died, April 12, in the Veterans Administration Facility, Columbia, of prostatic hypertrophy, uremia and chronic cystitis.

Guy Logan Qualls ● Colonel, M. C., U. S. Army, Fort Benning, Ga.; St. Louis University School of Medicine, 1909; entered the medical corps of the United States Army in 1912; served during the World War; after passing through the various grades became a colonel in 1939; fellow of the American College of Surgeons; aged 57; died recently.

Paul Stearns Mertins ● Montgomery, Ala.; Harvard Medical School, Boston, 1900; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staff of St. Margaret's Hospital; aged 63; died, April 10, of cerebral hemorrhage, uremia and hypertension.

L. Leo Doane, Highland Park, Ill.; College of Physicians and Surgeons, Baltimore, 1886; member of the Medical Society of the State of Pennsylvania and the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; aged 83; died, April 11, of acute dilatation of the heart.

Benjamin Rammel Veasey ● Wilmington, Del.; Jefferson Medical College of Philadelphia, 1894; fellow of the American College of Surgeons; formerly state senator; at one time member of the board of education; on the staff of the Wilmington General Hospital; aged 80; died, April 6, of gastric carcinoma.

Arthur William Karch, Monroe, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912; member of the Michigan State Medical Society; mayor; on the staff of the Monroe Hospital; aged 52; died, April 29, of gangrenous diverticulitis and myocarditis.

James Blackman Woodruff ● New Orleans; University of Tennessee Medical Department, Nashville, 1900; member of the Tennessee State Medical Association; acting assistant surgeon, U. S. Public Health Service; aged 63; on the staff of the U. S. Marine Hospital, where he died, April 22.

Leonard Herbert Stewart ● Kalamazoo, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1897; past president of the Kalamazoo Academy of Medicine; trustee of the Kalamazoo College; aged 82; died, April 21, in the Borgess Hospital of pyelitis and septicemia.

Arthur L. Oilar, Russiaville, Ind.; Indiana University School of Medicine, Indianapolis, 1913; served during the World War; formerly epidemiologist for the state board of health, and health officer of Talbot County, Md.; aged 48; died, April 25, of coronary occlusion.

Robert John Jones ● Greenfield, Ohio; Medical College of Ohio, Cincinnati, 1895; past president of the Highland County Medical Society; fellow of the American College of Surgeons; one of the founders and on the staff of the Greenfield Hospital; aged 68; died, March 11.

James Alexander Graham, Tagbilaran, Philippine Islands; Baltimore Medical College, 1897; member of the Philippine Islands Medical Association; a medical missionary; also a minister; superintendent of the Presbyterian Mission Hospital; aged 65; died, March 25.

Asa Wesley Graves, Lacey Spring, Va.; Medical College of Virginia, Richmond, 1910; member of the Medical Society of Virginia; served during the World War; aged 61; died, April 12, in the Rockingham Memorial Hospital, Harrisonburg, of diabetes mellitus.

Theodore Gervais, Berthierville, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1893; Laval University Faculty of Medicine, Quebec, 1893; aged 71; died, February 18, of pneumonia.

James R. Roberts, Hamilton, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1901; vice president of the International Society of Medical Health Officers; medical health officer; served during the World War; aged 61; died, March 15.

Frederick Newton Whitehorne, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895; New York Homeopathic Medical College and Hospital, 1898; aged 67; died, April 6, of coronary thrombosis.

Guy Arnold McCormack, Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1914; member of the Arkansas Medical Society; veteran of the Spanish-American and World wars; aged 66; died, April 6, of chronic myocarditis.

George De Loach Waller Sr., Bessemer, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; member of the Medical Association of the State of Alabama; aged 69; died, April 12, of hypertensive heart disease.

Emmett Earle Linville, Mount Olivet, Ky.; Hospital College of Medicine, Louisville, 1907; member of the Kentucky State Medical Association; served during the World War; aged 57; died, April 28, of coronary occlusion.

Thomas Youngman, Coral Gables, Fla.; Hahnemann Medical College and Hospital of Philadelphia, 1904; at one time bank president; formerly president of the board of health of Ventnor, N. J.; aged 59; died, March 11.

James B. Vaughan ● Monroe, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1901; medical director of the Vaughan-Wright-Bendel Clinic; aged 62; died, April 14, of acute dilatation of the heart.

John A. Mann, Wellington, Mo.; St. Louis Medical College, 1876; member of the Missouri State Medical Association; at one time bank president; formerly mayor; aged 88; died, April 20, of hemorrhage of the bladder.

Edward N. Gerard, Leonard, Mo.; University Medical College of Kansas City, 1895; member of the Missouri State Medical Association; aged 70; died recently in the Grim-Smith Hospital, Kirksville, of uremia.

Peter Winston Prather, Woodland Mills, Tenn.; University of Louisville (Ky.) Medical Department, 1906; member of the Tennessee State Medical Association; aged 61; died, April 14, of coronary thrombosis.

Edward S. Dwight, Smyrna, Del.; Yale University School of Medicine, New Haven, 1876; member of the Medical Society of Delaware; past president of the Kent County Medical Society; aged 86; died, March 17.

Ella Virginia Cameron, Philadelphia; Eclectic Medical College of the City of New York, 1895; aged 75; died, March 17, in a hospital at Greystone Park, N. J., of chronic myocarditis and mitral stenosis.

David Bernhard Hirschfeld ● New York; Cornell University Medical College, New York, 1910; aged 60; died, April 8, in the Mount Sinai Hospital of infection of the hand and suppurative phlebitis.

William E. Brann, Eldorado, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 88; died, April 29, in the Ferrell Hospital as the result of injuries received when struck by an automobile.

William Kenney, San Francisco; University of California Medical Department, 1905; assistant clinical professor of medicine at the Stanford University School of Medicine; aged 61; died, March 3.

Elliott Irving Osgood, Hiram, Ohio; Cleveland University of Medicine and Surgery, 1897; for many years a medical missionary in central China; aged 69; died, April 13, of cerebral hemorrhage.

Edward Routh Hines, Rocky Mount, N. C.; Medical College of the State of South Carolina, Charleston, 1916; aged 59; died, April 3, of ruptured esophageal varix with cirrhosis of the liver.

George Thomas Tubb, Aberdeen, Miss.; Memphis (Tenn.) Hospital Medical College, 1899; member of the Mississippi State Medical Association; aged 71; died in April of carcinoma of the liver.

George Guy Bailey ● Ipswich, Mass.; Harvard Medical School, Boston, 1892; on the staff of the Benjamin Stickney Cable Memorial Hospital; aged 75; died, March 30, of coronary thrombosis.

Parrott Rastus Hardee, Durham, N. C.; College of Physicians and Surgeons, Baltimore, 1885; aged 78; died, April 14, of bronchopneumonia and carcinoma of the stomach with metastasis.

Don Duff Campbell, Miami Beach, Fla.; University of Toronto Faculty of Medicine, Toronto, Canada, 1904; aged 65; died, March 27, in St. Francis Hospital of cirrhosis of the liver.

Randolph D. Jones, Elza, Ga.; University of Georgia Medical Department, Augusta, 1899; member of the Medical Association of Georgia; aged 63; died in March of heart disease.

Robert Lee Page, Batesville, Va.; Bellevue Hospital Medical College, New York, 1884; member of the Medical Society of Virginia; aged 76; died, April 29, of cerebral hemorrhage.

Lyman Jairus Clements ● Washington, D. C.; George Washington University School of Medicine, Washington, 1906; aged 74; died, April 12, of carcinoma of the parotid gland.

Edwin Rhinehart Yancey, Monroe, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1910; served during the World War; aged 33; died, March 16.

Ernest Ray Reynolds ● Chicago; Northwestern University Medical School, Chicago, 1900; on the staff of the Englewood Hospital; aged 65; died, April 24, of coronary occlusion.

Haydn Mozart Simmons, San Francisco; University of California Medical Department, San Francisco, 1901; aged 65; died recently in St. Francis Hospital of lobar pneumonia.

Mitchell C. Shelton, Joplin, Mo.; Barnes Medical College, St. Louis, 1894; member of the Missouri State Medical Association; aged 72; died, April 24, of coronary occlusion.

Josephine Ida Burpeau, Newark, N. J.; New York Medical College and Hospital for Women, New York, 1885; aged 82; died, March 25, in East Orange of cerebral hemorrhage.

Garrett Bancroft Breckinridge Larkeque, Pownal, Vt.; Homeopathic Hospital College, Cleveland, 1893; aged 68; died recently of chronic myocarditis and chronic arteritis.

Samuel Guy McCune, McKeesport, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1899; aged 65; died recently of cerebral hemorrhage and influenza.

Hugh Wilmer Duke, Amarillo, Texas; Baylor University College of Medicine, Dallas, 1901; justice of the peace; aged 66; died, March 23, of chronic myocarditis.

John Harvey ● Bryn Mawr, Pa.; Jefferson Medical College of Philadelphia, 1910; for many years on the staff of the Bryn Mawr Hospital; aged 57; died, March 18.

William Edward Segrest, Sardis, Miss.; Memphis (Tenn.) Hospital Medical College, 1900; aged 64; died, April 10, of cerebral hemorrhage and arteriosclerosis.

James Malcolm Miller, Villa Grove, Ill.; St. Louis University School of Medicine, 1905; aged 78; died, April 4, of chronic myocarditis and arteriosclerosis.

Albert Charles Geyser, Huntington, N. Y.; Bellevue Hospital Medical College, New York, 1896; aged 75; died, March 5, of pneumonia and arteriosclerosis.

Frederick E. Hammond, French Lick, Ind.; Hospital College of Medicine, Louisville, Ky., 1898; aged 68; was found dead in April of heart disease.

Tell John Berggren, San Diego, Calif.; American Medical Missionary College, Chicago, 1906; aged 63; died, March 10, of cardiac decompensation.

Daniel B. Rigdon, Cheyenne, Wyo.; College of Physicians and Surgeons, Keokuk, Iowa, 1882; aged 92; died, April 18, of gastric hemorrhage.

James A. Gold, Frankstown, Pa.; Homeopathic Hospital College, Cleveland, 1887; aged 79; died recently in Hollidaysburg of arteriosclerosis.

William Hermann Schultz, Cleveland, Tenn.; Chattanooga (Tenn.) Medical College, 1898; aged 66; died, April 28, of coronary occlusion.

George C. Wegefarth, Baltimore; Baltimore Medical College, 1897; aged 64; died, March 22, in the Johns Hopkins Hospital of peritonitis.

Claude Frank Hayes, Los Angeles; Hahnemann Medical College and Hospital, Chicago, 1897; aged 66; died recently of coronary thrombosis.

Ernest Bruce Hatch ● Miami, Fla.; Atlanta College of Physicians and Surgeons, 1910; aged 54; died, April 2, of coronary thrombosis.

Zeleander E. Crawley, Columbia, Miss.; University of Nashville (Tenn.) Medical Department, 1900; aged 65; died, April 10, of uremia.

Roland Rufus Johnson, Brooklyn; Long Island College Hospital, Brooklyn, 1907; aged 58; died, April 29, of acute coronary occlusion.

Maurice G. Slocum, Kansas City, Mo.; Keokuk (Iowa) Medical College, 1897; aged 65; died, April 12, of cardiac decompensation.

William F. Perry, Los Angeles; Kentucky School of Medicine, Louisville, 1885; aged 87; died recently of hypostatic pneumonia.

Louis John Feid, Cincinnati; Cincinnati College of Medicine and Surgery, 1893; aged 73; died, April 22, of coronary occlusion.

Sylvina Apphia Abbott, Cranston, R. I. (licensed in Massachusetts in 1894); aged 76; died, April 12, of angina pectoris.

William Dyer Gardner, Plain City, Ohio; Starling Medical College, Columbus, 1900; aged 64; died, April 30, of heart disease.

Alphonso L. Ruffe, Grand Rapids, Mich.; Chicago Homeopathic Medical College, 1887; aged 86; died, April 13, of uremia.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SUTURE MATERIAL FOR GYNECOLOGIC OPERATIONS

To the Editor:—What are the reasons of the American surgeons who use linen or silk in gynecology, especially in suspension operations (modified Gilliam Simpson). What is the difference between linen and silk suture if used in these operations? Could you quote some references?

Aaron N. Gerulik, M.D., Bronx, New York.

ANSWER.—Nearly all gynecologists as well as general surgeons who use suture material and not metal clips for approximation of the skin edges employ a nonabsorbable substance. In a large proportion of instances this substance is silk. Likewise for the purse-string suture preliminary to the invagination of an appendix stump, silk or linen is used almost universally. Also for the repair of intestinal, bladder and ureteral injuries during abdominal operations, silk or linen sutures are widely used. However, most general surgeons and gynecologists employ catgut for nearly all gynecologic operations performed abdominally. One type of operation, however, stands out in which many gynecologists use nonabsorbable sutures, such as silk or linen. This operation is suspension of the uterus, regardless of the type of operation performed. Thus Kelly employs silk or linen for his own method of suspending the uterus and also for the Simpson and the Cullen modifications of the Gilliam operation. Howard S. Kelly (Gynecology, New York, D. Appleton & Co., 1928, p. 483) also uses silk for suspension of the ovary. W. P. Graves (Gynecology, ed. 3, Philadelphia, W. B. Saunders Company, 1924) used silk when performing the Ohlhausen method of uterine suspension. Guthrie and Brown (*Pennsylvania M. J.* **43**:1153 [July] 1939) use silk for hysterectomies.

During the last few years there has been a distinctly increased tendency to use nonabsorbable material for sutures and ligatures, especially silk and metal alloys. In 1913 Halstead (THE JOURNAL, April 12, 1913, p. 1119) thus summarized his objections to the use of catgut: "The relatively high cost of catgut, its bulkiness, the inconveniences attending its use and sterilization, its inadequacy, the uncertainty as to the time required for its absorption, and the reaction which it excites in a wound induced me to discard it completely for clean wounds in the surgery both of the human subject and of animals. With the fine silk in our wounds, which for twenty-three years have, as a rule, been closed without drainage, suppuration almost never occurs. But catgut, even that which we have no cause to believe is not sterile, irritates the wound for some reason, perhaps because it serves as a culture medium for saprophytic organisms which are carried into it from the deep epithelium and follicles of the skin. It should be borne in mind that during the greater part of the period of its disintegration the catgut suture is not only not serving its purpose but is playing the rôle of necrotic tissue, of a culture medium. It is well within reason to expect that the technic may be at least so perfect when silk is employed that the wound will become infected not once in a hundred cases."

Clinical and experimental studies made during the last few years support Halstead's contention. Goff (*Surg., Gynec. & Obst.* **41**:728 [Dec.] 1925), in a study of 3,000 abdominal incisions at the New York Woman's Hospital, found that the average incidence of faulty wound incisions from all causes in clean abdominal incisions closed by absorbable suture material was 21.1 per cent, while in clean incisions closed by nonabsorbable suture material it was 4.3 per cent. Shambaugh and Dunphy (*Surgery* **1**:379 [March] 1937), experimenting with dogs, demonstrated that operative wounds repaired with silk tolerate bacterial contamination better than similar wounds repaired with catgut and that the healing of experimental suppurating wounds is not appreciably delayed by the presence of buried silk sutures and ligatures provided a fine grade of silk is used, the sutures are cut close to the knot and continuous sutures are not employed. Meleny (*Surg., Gynec. & Obst.* **60**:264 [Feb., No. 2a] 1935) claims that silk is superior to catgut for the following reasons: 1. Hemostasis is better, for the silk knots do not become untied as do catgut knots. 2. The cellular and fluid reaction about silk is minimal while about catgut it is maximal; silk is almost inert in the tissues while catgut is dead tissue which must be digested. 3. The use of silk automatically requires the surgeon to be more gentle with the tissues. Taylor (*Surgery* **5**:498 [April] 1939) maintains that linen and untreated silk are the safest materials as far as knots are concerned.

A. O. Whipple (*Internl. Abstr. Surg.* **69**:109, 1939, in *Surg., Gynec. & Obst.*, August 1939) stated that since silk has been adopted in his clinic the improvement in wound healing has been so striking as to leave no room for argument as to both immediate and late results. Whipple, however, says that silk must not be used unless the surgeon is willing to carry out certain rigid rules in technic. The errors which must be avoided are (1) tight sutures, (2) mass ligatures, (3) blunt scissors dissection, (4) careless hemostasis with blunt nose hemostats, (5) the use of any but the finest grades of silk—silk that will not break should not be used—(6) the combination of silk and catgut, (7) the use of silk in any but a sterile field and (8) continuous sutures.

Meade and Ochsner (THE JOURNAL, Dec. 16, 1939, p. 2230) advocated the use of cotton thread because it is easily sterilized and flexible, produces little tissue reaction and early fibroplasis, and hence is an extremely satisfactory suture material. Of 196 operative procedures carried out with cotton thread, healing by primary intention occurred in 191.

BLEEDING ESOPHAGEAL VARICES

To the Editor:—Please outline the treatment for the cure of bleeding from gastric and esophageal varices, the sequel of Banti's disease, first regarding the use of local styptics; second regarding the use of common anticoagulants such as thromboplastin; third as to supporting treatment such as transfusions and intravenous administration of dextrose and saline solutions, and fourth as to restricted intake of food. In addition could you give me the reference in the literature to the ligation of the arteries on the lesser curvature of the stomach for the treatment of gastric varices.

M.D., Ohio.

ANSWER.—Hemorrhage from esophageal varices is the chief cause of death in cases of portal cirrhosis and Banti's disease. The important feature in Banti's disease is portal hypertension (Rousselot, L. M.: Role of Congestion [Portal Hypertension] in So-Called Banti's Syndrome, THE JOURNAL, Nov. 28, 1936, p. 1788) and it is this increased pressure in the portal system, due probably to obstruction to the flow of blood through the splenic and portal veins, that leads to a compensatory dilatation of the normal anastomotic channels between the coronary vein of the portal system on the one hand and the branches of the azygos major vein of the systemic circulation on the other. These anastomotic veins lie in the submucous layer of the lower end of the esophagus and in the cardia. The high pressure of the portal system is transmitted directly to these anastomoses and causes them to enlarge and become tortuous. Their exposed position subjects them to trauma, and the high venous pressure results in unusually profuse bleeding when rupture occurs. The use of local styptics and common anticoagulants is not feasible because of the inaccessibility of the area involved and the danger of introducing an esophagoscope. Transfusions with blood and physiologic solution of sodium chloride are of service in restoring the circulating volume and should be used in acute hemorrhage as an immediate life saving procedure and later because of the danger of a prolonged period of excessively low blood pressure (Blalock, Alfred: *Proc. Inst. Med. Chicago* **9**:405 [Nov. 15] 1933). Westphal (*Deutsche med. Wchnschr.* **56**:1135 [July 4] 1930) succeeded in stopping the hemorrhage from esophageal varices in two cases of cirrhosis of the liver by introducing a Gottstein bag and filling it with 80 cc. of water. The pressure was maintained for twenty-four hours. Walters, Rowntree and McIndoe attempted to control bleeding from esophageal varices of patients with portal cirrhosis and Banti's disease by ligating the coronary vein on the lesser curvature of the stomach (Rowntree, L. G.: *Proc. Staff Meet., Mayo Clin.* **4**:121 [April 17] 1929. Walters, Waltman; Rowntree, L. G., and McIndoe, A. H., *ibid.* **4**:146 [May 8] 1929. Rowntree, Walters and McIndoe, *ibid.* **4**:263 [Sept. 4] 1929). In the patient with Banti's disease a severe hemorrhage occurred later, but after removal of the spleen the bleeding stopped, at least temporarily. Kirklin and Moersch (*Radiology* **17**:573 [Sept.] 1931) reported that a large spleen was removed from a young man because of bleeding from varices which were demonstrated by roentgenography; the coronary veins were not ligated. Three weeks later the varicosities were found unchanged on fluoroscopic examination. Kegaries (*Surg., Gynec. & Obst.* **58**:46 [Jan.] 1934) made injections in the anastomosing channels in the lower esophagus through the coronary vein in eight of sixteen bodies and as a result of his study advised ligation of the coronary vein and the vasa brevia of the spleen together with splenectomy and a Talma-Morrison omentopexy. McClure (*J. Michigan M. Soc.* **33**:581 [Nov.] 1934) ligated the coronary veins and later removed the spleen

of a patient with Banti's disease and hematemesis, with apparent relief. Rhoads and Stein (*Am. J. Dis. Child.* 56:119 [July] 1938) ligated the coronary vessels and removed the spleen from a boy with Banti's disease who had bled seriously from esophageal varices demonstrated by roentgenograms. Bleeding stopped and subsequent examination revealed reduction in the size of the varicosities. L. R. Dragstedt has removed the spleen, ligated the veins at the cardia and injected 5 cc. of sodium morrhuate into the veins above the ligatures in three cases of portal hypertension, splenomegaly, esophageal varicosities and repeated severe hemorrhages. Two of the patients remained well for periods of two and four years, and roentgenograms revealed the absence of varicosities which were demonstrated before operation. In the third case the varicosities remained just as large after the operation and injection, and death occurred later of hemorrhage.

"BILIOUS FEVER"

To the Editor:—In the early history of Davenport, according to the records, a prominent citizen died of "bilious fever." Within two weeks, two other members of the same family died of the same thing. I should like to know if at that time (about 1835) "bilious fever" was a common diagnosis. Was it considered a clinical entity? From our present knowledge what would be the probable diagnosis? It may have been malaria, which was prevalent here in those days, except that three deaths so close together would indicate some contagious disease. Typhoid was common, but the doctors at that time were not often fooled with this diagnosis.

W. H. Readhimer, M.D., Davenport, Iowa.

ANSWER.—The diagnosis "bilious fever" was popularized by Maximilian Stoll (1742-1787), who regarded all fevers as due to "gastrobilious" impurities. William Buchan, of Edinburgh, whose Treatise on the Prevention and Cure of Diseases was published in Philadelphia in 1784, states that "when a continual, remitting or intermittent fever is accompanied with a frequent or copious evacuation of bile, either by vomit or stool, the fever is denominated bilious." His description of "bilious fever" suggests most strongly typhoid fever. Dr. John Sappington in his Theory and Treatment of Fever, published in 1844, devotes a chapter to the "common bilious or bilious remittent fever." Sappington's description also suggests typhoid. He described a long continued fever with delirium, diarrhea, brown coated tongue, full soft pulse and great thirst. Charles Murchison, in his treatise on the Continued Fevers of Great Britain (London, 1873), lists "bilious fever" as a synonym for typhoid.

PROBABLE MILIUM OF EAR

To the Editor:—A young man under treatment for a duodenal ulcer called my attention to a group of white indurated papules on the back of each ear. At present there are about thirty on each ear but he states that there have been many more than that at times. They vary in size from about 0.1 to 0.5 cm. His wife noticed them about three months ago and he states that she expressed some drops of clear secretion from them which she noticed had an offensive odor. He says that at weekly intervals she has so expressed them, the last time four days previous to his present visit. I could express no visible drops of secretion but on rubbing my finger firmly over them enough was expressed to corroborate her statement as to the odor. It was offensive and required brisk rubbing with soap and water to remove. A small incision in one of the larger papules did not produce any appreciable amount of secretion at this time. There is present a mild oily seborrhea and a mild acne vulgaris. The young man is of dark complexion. He has been using acetylsalicylic acid and acetylsalicylic acid compound frequently, from 10 to 30 grains daily (0.65 to 2 Gm.), for several months for a unilateral (right side) headache of an yet undetermined origin. A general examination following a gastric hemorrhage in November 1938 revealed an epigastric hernia and a duodenal ulcer. Previous to the hemorrhage he had had the same type of headache as now and a mild constipation but none of the usual symptoms of ulcer. Placed on strict medical management he felt better generally, the headaches were relieved and an x-ray examination in January 1939 was negative. There was no evidence of the previous ulcer. He was allowed a more liberal diet until the return of the headaches but has obtained practically no relief from a strict medical management since. In the general examination, blood studies including a Wassermann test were normal. His eyes and sinuses showed no abnormalities. I have not seen a similar eruption with acne or seborrheic dermatitis previously. Is it probably a part of the picture of one of these entities or a separate condition of the sebaceous or oil glands? I mention his general condition at some length as I found nothing in several textbooks on dermatology by which I could make a definite diagnosis.

M.D., Minnesota.

ANSWER.—White hard papules from 0.1 to 0.5 cm. in diameter suggests milium, which means millet seed. It is true that these papules seldom exceed 0.2 cm. in diameter, but they sometimes grow larger than this. It is these large ones whose content of subaceous matter is most apt to degenerate, soften and smell bad. If this is the correct diagnosis, the odor resembled that of butyric acid, which is offensive and persistent enough. The small incision mentioned should have freed the contents of the papule; but it is likely that pressure was needed to bring out the hardened sebum. After cleansing the skin with alcohol, one can incise the skin covering the papule and press out the pearl-like contents. The lesions seldom recur. The daily application of lotio alba (sulfurated potassa 1 Gm., zinc sulfate 1.5 Gm. and rose water to make 30 cc.) will aid in preventing their formation, which results from the overgrowth of the horny layer, a factor in the causation of acne.

TREATMENT OF PINWORM INFESTATIONS

To the Editor:—Do threadworms ever get into the urinary bladder? A 7 months old baby has them in the bowels, nose and mouth. The parents also have them. I am using chenopodium oil on the baby internally and 1 per cent chenopodium oil in olive oil in the nose. I am not sure that the worms are in the bladder but the mother states that they are found under the foreskin. Please send information.

W. A. Brand, M.D., Redwood Falls, Minn.

To the Editor:—Can you inform me what the new and improved methods of therapy are for pinworm infestation referred to by Willard H. Wright in the March 1939 issue of *Hygeia*?

G. O. Granhoyd, M.D., Santa Paula, Calif.

ANSWER.—A search of the literature has failed to reveal an authenticated case of threadworms (Enterobius vermicularis) in the bladder. However, the gravid female worms after their emergence from the anal canal frequently migrate extensively. In women they may enter the vagina and have been found in the uterus, fallopian tubes and the peritoneal cavity. It is suggested that the present treatment of the infant be supplemented with enemas every other night for a period of from three to four weeks. For this purpose saline enemas may be used, although the use of enemas consisting of a 1:2,000 solution of hexylresorcinol in water will give better results. Some children are particularly susceptible to the local irritating properties of hexylresorcinol. In such event the drug should be further diluted. It would be advisable to treat both parents and all other infected members of the family at the same time in order to reduce opportunities for reinfection. For this purpose the use of gentian violet medicinal N. N. R. is indicated.

At the present time the most effective treatment for the removal of pinworms (Enterobius vermicularis) consists in the administration of gentian violet medicinal N. N. R. Either enteric coated or water soluble coated tablets may be used. The dose of gentian violet for adults is 1 grain (64 mg.) three times a day before meals for eight days; the treatment is discontinued for a week and then repeated for an additional period of eight days. The dosage for children over 3 years of age is based on 0.01 Gm. a day for each year of apparent (not chronological) age. This daily dosage should be divided into three parts. The treatment is carried out in the same manner as for adults. About one third of cases treated with gentian violet show some reaction, consisting usually of nausea, vomiting, diarrhea, constipation and slight abdominal pain. If reactions ensue, it is advisable to reduce the dosage or withhold treatment for a day or two until the patient returns to normal. Gentian violet is contraindicated in moderate to severe heart, hepatic and renal disease, in gastro-enteritis, in pregnancy and in the presence of febrile or debilitating diseases. The patient should abstain from alcohol during the period of treatment. Persons suffering from ascariasis should be treated for the removal of ascarids before the administration of gentian violet.

In controlling pinworm infestation within the household, it is necessary to treat all infested members simultaneously in order to reduce opportunities for reinfestation through eggs scattered around the house by nontreated individuals.

COLORED PAPER AND VISUAL DISABILITY

To the Editor:—I have been asked to make a report on the effect of various colored paper used in clerical work on the eyes of the workers. The state social welfare department uses paper of a distinct color for each department under its supervision. These include pink, green and yellow as well as white. The departments using the pink seem to have a greater incidence of visual disabilities than the others. Can you refer me to any recent literature on this problem?

William A. Pettit, M.D., Los Angeles.

ANSWER.—In all probability, the greater visual disabilities in the department using pink paper are coincidental rather than the result of the color of the papers employed. There has been considerable discussion on this topic off and on for the past twenty-five years and the majority view is epitomized in the various books by Matthew Luckiesh, of Nela Park. The first of these was published in 1915 and since then some seven of his publications have touched more or less on this topic. All of the volumes have been published by the Williams and Wilkins Company, of Baltimore.

PROBABLE ERYTHROCYANOSIS FRIGIDA

To the Editor:—A stenographer aged 22 has suffered for ten years with severe pain and occasional slight redness of the extensor side of the lower third of the lower part of the left leg. This severe pain appears every year as soon as cold weather sets in. It disappears with the beginning of warm weather. The pain is so severe at times that the girl is unable to work and loses considerable weight during the winter months. There is no itching. Cold in summer, such as cold water in bathing, does not produce the pain. Heat never relieves it. The right leg was never painful, even in the coldest weather. The girl has no other symptoms. Menstruation is regular. Results of physical examination were always negative. In the region of the pain at times a bluish red discoloration without induration could be seen; but these changes were practically the same in the right leg. The pulses of the popliteal, posterior tibial and dorsalis pedis arteries are of good quality in both legs. There are no changes of sensory functions, including the vibratory sense. The blood pressure in the two legs is equal and normal. Results of urine examination are normal. The hemoglobin level is 86 per cent; red blood cells number 3,900,000 and white blood cells 10,000 with the following differential count: band forms 2, segmented cells 52, lymphocytes 35, monocytes 4, eosinophils 4; the bleeding time is two and one-half minutes, the coagulation time six and one-half minutes and the Wassermann reaction negative. The condition has been treated as frost bite for years without any success. The question arises Do we have to deal in this case with changes in the vascular system? The lack of objective signs and the fact that cold during the summer time does not produce the symptom of pain seem to speak against this diagnosis. Please advise me as to diagnosis and treatment.

M.D., Connecticut.

ANSWER.—The condition described fits into the clinical picture of a malady less frequently seen here than on the European continent, namely erythrocyanosis frigida. In this lesion the skin looks much like that observed in the vasospastic types of poliomyelitis, and it is probable that the same etiologic factors, an insufficient venous return, an increase in the amount of fat in proportion to muscle and exposure to cold, are in operation in both diseases. As in poliomyelitis, the most severe cases show indurations and ulcerations and there gradually develops a great thickening of the subcutaneous tissues above the ankles.

Abortive poliomyelitis and the presence of spina bifida occulta often associated with erythrocyanosis and pes cavus should be ruled out. This condition is most frequent in girls at about the time of puberty, and the milder forms become less troublesome with advancing years. Those with the painful and especially with the indurated or ulcerated type should be subjected to a lumbar sympathectomy. Late results of this operation are satisfactory.

MILD DIABETES

To the Editor:—A rather obese man about 45 years of age has had glycosuria for six years. Until about a year ago his fasting blood sugar was around 120 or less but now is 140. He has never taken any insulin but was and is able to remain sugar free (urine) by rather strict limitation of "starchy" foods with no sweets. Within the past year he has begun eating starchy foods occasionally and when he does so his urine shows 2 per cent sugar on the following forenoon. He was in apparently perfect health, felt good, lost some weight (but not too much) and had plenty of energy on his low carbohydrate diet. Of course he occasionally complained of some hunger. Now one of his nephews has finished medical school and advises him by all means to take insulin and increase the carbohydrate intake, while I have been advising him to stick to the low carbohydrate diet with no insulin unless diabetes becomes more severe. He is a druggist, is 5½ feet (160 cm.) tall and weighs from 190 to 195 pounds (about 87 Kg.). Which advice is right?

M.D., Louisiana.

ANSWER.—With such mild involvement the patient has a good prospect to live out the normal life expectancy, which at 45 years is twenty-five years for men. To do this and to avoid complications, he should take advantage of protamine zinc insulin once a day, which surely would allow him daily between 150 and 200 Gm. of carbohydrate, perhaps more, with sufficient protein, from 80 to 100 Gm., and fat sufficient for caloric needs. Gradual, slow reduction of weight should be carried out not only for its probably beneficial influence on the diabetic condition but also to prevent harmful effects of obesity on the body in general.

Both opinions are right to a certain extent for the immediate welfare of the man, but one should plan also for the twenty-five years more to come.

PROSTIGMINE AND PITRESSIN WITH MORPHINE

To the Editor:—Are prostigmine methylsulfate and pitressin compatible with morphine and are they used simultaneously with morphine in postoperative cases such as cholecystectomies?

M.D., Kentucky.

ANSWER.—Pitressin and prostigmine are used to relieve the bowel and bladder atony following abdominal section. The increase in tone of the muscular coat of the intestine is due to the stimulation of the plexus of Auerbach and structures peripheral to this. They seem to sensitize the motor autonomic system to normal stimuli. Morphine is used principally to relieve pain due to trauma. Its action on the peripheral endings of the autonomic nervous system is slight when given in therapeutic doses. (Opium, owing to its isoquinoline alkaloids, does have a paralytic action on the peripheral endings of the autonomic nervous system.) Hence pitressin and prostigmine methylsulfate are compatible with morphine sulfate and may be used simultaneously in postoperative cases.

LIQUID SHAMPOO SOAP

To the Editor:—Will you please give me the ingredients of a good soap for shampooing the scalp. If no perfume is present, would it be possible to add something to give the shampoo mixture a faint perfume?

J. Wesley Bulmer, M.D., Glen Cove, N. Y.

ANSWER.—There are eight useful formulas for shampoos in the Recipe Book (American Pharmaceutical Association) including liquid and dry forms for dry and oily scalps. A representative "liquid shampoo soap" formula from this list is as follows:

Coconut oil	66 Gm.
Cottonseed oil	78 cc.
Stearic acid	36 Gm.
Potassium hydroxide	42 Gm.
Potassium carbonate	9 Gm.
Alcohol	42 cc.
Purified talc	10 Gm.

Distilled water, a sufficient quantity to make 1,000 cc.

Melt the stearic acid in the oils heated to about 82 C. Add the alkalis dissolved in 100 cc. of distilled water and then the alcohol; heat until saponified. When cool, add sufficient distilled water to make the product measure 1,000 cc. Add the talc and filter.

Any perfume desired may be added. Rose water, bay rum odor, oil of bergamot, oil of lavender, oil of eucalyptus, oil of dwarf pine needles and oil of rose geranium are recommended.

FATAL HEMORRHAGE FROM UMBILICAL CORD

To the Editor:—Recently I had a case of hemorrhage from the umbilical cord which terminated fatally. The hemorrhage occurred six hours after delivery and ligation of the cord, in an apparently normal full term infant weighing 7 pounds (3.2 Kg.). The hemorrhage was excessive but had ceased on my arrival. As I lacked facilities for proper emergency treatment, the infant died in about an hour. Inspection of the stump and ligature showed a perfect ligation and the bleeding had occurred past the ligature at the severed end of the cord. At the beginning of pregnancy the mother had a 4 plus blood Wassermann reaction and during the middle trimester she took twelve injections of neoarsphenamine and twelve injections of a bismuth compound, no blood tests being taken after this and no cord Wassermann test being made at the time of delivery. From what I am able to find in the literature, hemorrhage from imperfect ligation of the cord seldom occurs this late after delivery unless there is some blood dyscrasia present. Could this have been due to congenital syphilis? I might add that resuscitation of the infant was normal and there were no signs of asphyxiation. Any information that you can give me with regard to the probable cause of this misfortune will be greatly appreciated.

M.D., Texas.

ANSWER.—Blood dyscrasias, congenital syphilis and hemorrhagic disease of the newborn (prolonged prothrombin time) may cause hemorrhage from the umbilical cord, but the bleeding is more prone to occur at the point of ligation (superimposed trauma) than at the severed end of the cord. However, any of these blood conditions sufficiently severe to cause a fatal hemorrhage from the cord would also cause severe bleeding from other areas, especially the mouth, gastrointestinal tract, nose and vagina. Bleeding from hemorrhagic disease usually does not appear for about twenty-four hours after birth. In short, a rapid severe or fatal hemorrhage from the severed end of the umbilical cord occurring six hours after labor in a normal appearing infant, without other external evidence of a hemorrhagic diathesis, would lead one to believe that the ligature had slipped or loosened in some way.

PROGNOSIS IN INFECTIOUS MONONUCLEOSIS

To the Editor:—I am writing to ask if you have any information as to the prognosis of infectious mononucleosis. I had this condition in a mild form several months ago and my policy with my health insurance was put in force with a waiver for any diseases of the white corpuscles. I am unable to find reference in any of the literature in which the disease, when ended, was not cured. Are there any cases on record of such a disease after the cure?

M.D., Ohio.

ANSWER.—The immediate prognosis of infectious mononucleosis is almost always good. A few cases have been reported with accompanying severe hepatitis or nephritis. Concerning the late prognosis, a mild anemia is common. Easy fatigability is frequently present for several months. The blood usually shows a lymphocytosis which may last as long as a year. No more serious complications are known. The only justification for a different prognosis is the possibility of a mistaken diagnosis. Leukemia can be confused with mononucleosis, although the differentiation usually is easily made and reasonably certain.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, June 1, page 2240.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, Sept. 3. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: *Basic Science.* Tucson, June 18. Sec., Dr. Robert L. Nugent, University of Arizona, Science Hall, Tucson. *Medical.* Phoenix, July 2-3. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). Los Angeles, July 15. *Written examination.* San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: Denver, July 2-6. *Applications must be on file not later than June 17.* Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Written.* Hartford, July 9-10. *Endorsement.* Hartford, July 23. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* Date, July 9-10. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination.* Dover, July 9-11. *Reciprocity.* Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Oct. 21-22. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 1. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, 353 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 25-27. Superintendent of Registration, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science.* Des Moines, July 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 903 N. Seventh St., Kansas City.

MAINE: Augusta, July 2-3. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 9-11. Sec., Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: *Medical.* Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing. *Basic Science.* Detroit, June 28-29. Pres., Dr. R. C. Houston, East Lansing.

MINNESOTA: Minneapolis, June 18-20. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June 26-27. Asst. Sec., Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity.* Helena, Sept. 30. *Written.* Helena, Oct. 1-2. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEVADA: *Reciprocity with oral examination.* Aug. 5. Sec., Dr. Fred M. Anderson, 213 N. Carson St., Carson City.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 7-8. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 24-27. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OREGON: *Medical.* Portland, June 18-20. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. *Basic Science.* July 1. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: *Written.* Philadelphia and Pittsburgh, July 9-11. *Bedside.* Philadelphia, July 12-13. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, 358 Education Bldg., Harrisburg.

PUERTO RICO: San Juan, Sept. 3. Sec., Dr. O. Costa Mandry, Box 3854, Santurce.

RHODE ISLAND: Providence, July 10-11. Sec., Division of Examination, Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: *Medical.* Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre. *Basic Science. Written.* Yankton, June 7-8. *Endorsement.* Watertown, June 22. Sec., Dr. Gregg M. Evans, Yankton.

TENNESSEE: Knoxville, Memphis and Nashville, June 14-15. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: San Antonio, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 11-13. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: *Basic Science.* Seattle, July 11-12. *Medical.* Seattle, July 15-17. Sec., Department of Licenses, Mr. Nelson N. Vaughen, Olympia.

WEST VIRGINIA: Huntington, July 1-3. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

Illinois January Examination

Mr. Lucien A. File, superintendent, Illinois Department of Registration and Education, reports the written examination (graduates of foreign schools given also a practical test) held at Chicago, Jan. 23-25, 1940. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Seventy-six candidates were examined, seventy-three of whom passed and three failed. Twenty-seven physicians were licensed by reciprocity and six physicians were licensed by endorsement. The following schools were represented:

School	PASSED Year Grad.	Per Cent
Chicago Medical School	(1939) 78, (1940)	82
Loyola University School of Medicine	(1939) 78,* 87, (1940) 79, 80, 83	77,
Northwestern University Medical School	(1936) 80, 82,* 83, 83, 84, 86, 87*	78,
Rush Medical College	(1937) 76,* 79, 79, 80, 81, 82, 83,* 84, 88*	85,
The School of Medicine of the Division of Biological Sciences	(1938) 80, 81, 81, 82, 83, 85, 87	81, 82
University of Illinois College of Medicine	(1939) 80,* 80,* 80, 81, 81, 82, 83, 85, 87	77,
St. Louis University School of Medicine	(1937)	78
Syracuse University College of Medicine	(1936)	83
University of Cincinnati College of Medicine	(1939)	85
Marquette University School of Medicine	(1940)	80
Medizinische Fakultät der Universität Wien	(1923) (1925) 75, 77, 77, (1926) 77, (1928) 78, 79, (1932) 80, (1934) 80, 82, (1935) 75, 81, (1936) 78, (1937) 81, (1938) 80	80,
Universita Karlova Fakulta Lékařská, Praha	(1909)	75
Albertus-Universität Medizinische Fakultät, Königsburg	(1924) (1925) 81	75,
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1921) 80, (1928)	78
Hamburgische Universität Medizinische Fakultät	(1920)	77
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main	(1927)	76
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg	(1927)	77
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1923)	80
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn	(1926)	75
Schlesische Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau	(1916) 76, (1920) 78, (1934)	84
Universität Heidelberg Medizinische Fakultät	(1932)	75
Uniwersytet Jana Kazimierza Wydzial Lekarski, Lwow	(1936)	76
Universität Bern Medizinische Fakultät	(1936)	77

School	FAILED Year Grad.	Number Failed
Chicago Medical School	(1937)	1
Medizinische Fakultät der Universität Wien	(1937)	1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1917)	1

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1927)	Arkansas
University of Southern California School of Medicine	(1936)	California
Northwestern University Medical School	(1929) (1931) Pennsylvania, (1934) Iowa, (1938) New Jersey	Kansas,
The School of Medicine of the Division of Biological Sciences	(1937)	Iowa
State University of Iowa College of Medicine	(1936)*	Michigan
University of Kansas School of Medicine	(1937)	Kansas
Tulane University of Louisiana School of Medicine	(1915)	Louisiana
University of Michigan Medical School	(1925),* (1936)	Michigan
Wayne University College of Medicine	(1932)	Michigan
St. Louis University School of Medicine	(1929)*	Missouri
Washington University School of Medicine	(1924) (1924),* (1936)* Missouri	Wisconsin,
Creighton University School of Medicine	(1937)*	Nebraska
Ohio State University College of Medicine	(1936)	Ohio
Hahnemann Med. College and Hospital of Philadelphia	(1927)*	Penna.
Vanderbilt University School of Medicine	(1936)	Tennessee
Baylor University College of Medicine	(1936)	Texas
Medical College of Virginia	(1934)	Virginia
Marquette University School of Medicine	(1938)	Ohio
University of Wisconsin Medical School	(1930)	Missouri
University of Alberta Faculty of Medicine	(1928)	Wisconsin
University of Western Ontario Medical School	(1929)	W. Virginia

School	LICENSED BY ENDORSEMENT Year Grad.	Endorsement of
University of Colorado School of Medicine	(1932)	N. B. M. Ex.
Yale University School of Medicine	(1937)*	N. B. M. Ex.
George Washington University School of Medicine	(1938)	N. B. M. Ex.
Loyola University School of Medicine	(1935)	N. B. M. Ex.
Syracuse University College of Medicine	(1936)	N. B. M. Ex.
Jefferson Medical College of Philadelphia	(1930)	N. B. M. Ex.

* Licenses have not been issued.

Book Notices

Physiological Chemistry: A Text-Book for Students. By Albert P. Mathews, Ph.D., Andrew Carnegie Professor of Biochemistry, The University of Cincinnati, Cincinnati. Sixth edition. Cloth. Price, $8. Pp. 1,488 with 113 illustrations. Baltimore: William Wood & Company, 1939.

Many physicians learned their biochemistry with the aid of earlier editions. The book has been extensively revised and rearranged. Much of the older material that has been retained has been rewritten. The laboratory section is omitted from the present edition. This book is not a brief manual but rather a collection of essays on the chemistry of the body. Many new items appear in the present edition. There are, for example, brief discussions of the pyranose formula of alpha-dextrose, the newer conceptions of the chemistry of the disaccharides and polysaccharides, and there is an entire chapter on glycolysis presented as only a master could do it. This is followed by a chapter on the carbohydrate metabolism of muscle and other tissues, a discussion of the metabolism of malignant cells and a chapter on the carbohydrates of the nucleus. Reference is made in the latter chapter to the work of Anderson and his associates on the chemistry of the tubercle bacillus. Each chapter contains a select bibliography of important papers and reviews. The chapters on fats and other lipids are not perhaps as complete as the corresponding chapters on carbohydrates, but this is probably the fault of the subject. The discussion of the sterols includes mention of the chemistry of cholesterol and related sterols of plant and animal tissues, the bile acids and the sex hormones. Bile is discussed in the section on digestion in the intestine, an arrangement which is somewhat unfortunate because the material on bile acids is discussed under sterols. The chapter on the viscosity of blood and on clotting is so complicated with terminology as to raise a question about its helpfulness to the beginning student. On the whole, however, the book can be commended. It emphasizes the rapid progress that has been made in biochemistry within recent years, a development which, the author points out, has made the material aspects of medicine more nearly an exact science.

Health Is Wealth. By Paul de Kruif. Cloth. Price, $2. Pp. 246. New York: Harcourt, Brace & Company, 1940.

Here, in a small volume, Paul de Kruif has collected essays from the *Country Gentleman*, in which he campaigns for great expenditures in the field of public health. He favors a national health program, as who does not? He tells how Detroit fought tuberculosis. And then he tells how in December 1937 he and Surgeon-General Parran prepared a two page memorandum entitled "The Essentials of a National Health Program." This apparently was given to the President by Basil O'Connor of the National Foundation for Infantile Paralysis.

Then comes the story of the so-called National Health Conference, in which de Kruif recognizes the attempt of this conference to destroy public confidence in the medical profession, and he says "The net result of the conference was that the American people had less faith in the army that alone could fight for its higher level of health."

Next comes an account of a conference with Harry Hopkins and the preparation of a memorandum for him which he was to send to the President. Apparently nothing ever came of that. In his own words, de Kruif feels that he participated in the folly of a "ride on the Washington merry-go-round."

This chapter serves as the introduction to the essays which have appeared in the *Country Gentleman*, proposing de Kruif's own national health program. They are Human Erosion and Human Conservation.

Then de Kruif heard that Senator Wagner was going to introduce the Wagner Health Bill, and he arranged for an audience with Senator Wagner. He presented the Senator with copies of these articles, but apparently their effect, he says, was nil. The Wagner Health Bill itself he calls a "comedy of errors."

Next come three more essays from the *Country Gentleman*, endeavoring to give de Kruif and that periodical leadership in the organization of public health for the American people. Then de Kruif tells how he, with certain Michigan physicians, arranged a conference with Dr. Thomas Parran with the idea of trying to get the government to withdraw its law suit against the American Medical Association and how the Michigan physicians prepared with de Kruif and Parran a national health program which they would approve. On Dec. 13, 1939, de Kruif had an opportunity to take to the President his ideas and those of his associates regarding the national health program. Apparently the President told him on that date of his own plan for building hospital health centers in rural regions and that it was quite possible to embark on such a plan as de Kruif presented. As every one knows, the hospital bill, conceived by the President and modified through numerous hearings before the Senate Subcommittee on Labor and Education, unanimously passed the United States Senate on May 30.

One finds a de Kruif with somewhat a new point of view in his concluding paragraphs—a de Kruif who is for the medical profession. Thus he says "The people can take courage from the stir in the ranks of their physicians. They have gone on record as being ready to take their place as pioneers in a nation-wide advance toward a higher level of life which the people are already demanding. This advance will not be dictated by spurious political promises or by any well intentioned but unreliable spirit of do-gooding. It will be guided by the power of medical science."

Treatment by Manipulation. By H. Jackson Burrows, M.D., F.R.C.S., Assistant Orthopædic Surgeon, St. Bartholomew's Hospital, London, and W. D. Coltart, M.B., F.R.C.S., Chief Assistant, Orthopædic Department, St. Bartholomew's Hospital. Published by "The Practitioner." Cloth. Price, 5s. Pp. 96, with 30 illustrations. London: Eyre & Spottiswoode, [n. d.].

This book is written by two orthopedic surgeons of considerable note and experience obviously in order to put manipulative surgery on a safe basis by means of proper selection of the cases and an understanding of the underlying principle, as is indicated in the preface to the book. It is called manipulative treatment rather than manipulative surgery and concerns itself with the passive movement of joints. To clarify the nomenclature the authors define sprain, acute or chronic, in reference to the joint only, while a strain is used in connection with particular components such as ligaments and, therefore, the sprain is the more general and the strain the more restricted term. It is gratifying to note that the principles of H. O. Thomas and his regard for the unsound joint is, at least by implication, recognized. From this point of view the short chapter on the selection of cases for manipulation is of particular interest. The authors consider the ideal case for manipulation the chronic sprain or strain resulting from chronic trauma with long continued mechanical strain, as for instance in scoliosis, lordosis and pes varus. Consequently they name inactive osteo-arthritis as one of the conditions suitable for manipulation, while tuberculous arthritis and any other form of arthritis, even though inactive, is definitely classed among the groups in which manipulation should not be applied. In only a few acute conditions is this treatment permissible. The method of manipulation and the details of technic are given special attention, particularly as far as the foot and ankle are concerned; also the treatment of the locked knee, the manipulation of the hip, especially in osteoarthritic cases, and the manipulation of the spine. The methods are described in detail and in their different component manipulative steps. It is especially gratifying that the dangers of manipulation are emphasized, which lie first in the improper selection of the cases themselves and then from trauma by improper manipulation. The use of too much force is condemned, it being likely to lead to such complications as avulsion of the tibial tubercle, fracture of the upper end of the humerus, fracture of the metatarsal bones, or crush fracture of the vertebrae. Special caution is advocated in the treatment of osteoporosis from immobilization or from senility. The reader is warned in particular against such conditions as may lead to complications after manipulative maneuver. The book is well worth reading; it is written clearly and comprehensively and, above all things, it demonstrates the pathologic knowledge which is a welcome safeguard against the abuse of the method, which is so slow in being accepted by the medical profession having once fallen in disrepute by indiscriminate use.

Intelligence and Crime: A Study of Penitentiary and Reformatory Offenders. By Simon H. Tulchin. Cloth. Price, $2. Pp. 166, with 13 illustrations. Chicago: University of Chicago Press, 1939.

Time was when the evils of mankind were explained, in large measure, by the bogy of feeblemindedness. Poverty, unemployment and crime were directly related to intelligence defect. When systematic tests of intellectual capacity were applied in a routine way to some millions of American youths at the time of the draft for the World War, it was disconcerting to this theory to find that, according to the accepted standards at that time, one fourth of the young men accepted for the army were classifiable as feebleminded. This caused enormous readjustments in the concepts of intelligence, feeblemindedness and intelligence testing. It ought to have completely demolished the theory that crime was the result of stupidity, but it didn't.

Dr. Herman Adler, state criminologist of Illinois and director of the Institute for Juvenile Research, was anxious to substitute facts for theories regarding this question, although he himself was convinced that it was absurd to relate crime directly to feeblemindedness. In one brief survey he showed that the intelligence capacity of the guards of one of the Illinois prisons was distinctly below that of the criminals that were guarded; but he sought to have the matter thoroughly investigated, and a number of psychologists—E. K. Wickman, John Metcalf and the author of this book—set to work and surveyed the population of the penal and correctional institutions in the state. Following the survey, during the seven years between 1920 and 1927, Tulchin examined more than 10,000 prisoners in three penal institutions in the state of Illinois.

Now, twelve years after the survey was completed, the results of these studies have been carefully tabulated, correlated and analyzed. In this small book, more data pertaining to the relation of intelligence to crime are assembled than in any other existing study. In addition, intelligence is considered in relation to nativity, race, recidivism, age, height, weight, educational record, marital status, employment status, and religion of the criminals.

As compared with the army experience, it is quite clear that feeblemindedness is no more characteristic of criminals at large than it is of noncriminal youth. For example, 23.4 per cent of the population of the penitentiary were classifiable as inferior; but 25.9 per cent of the United States Army recruits were thus classifiable. Of the pentitentiary population, 11.8 per cent was classifiable as superior; of the army, 10.6 per cent. In the reformatory, only 15 per cent of the men were rated as inferior and 13 per cent as superior. But while feeblemindedness cannot be said to cause or be related directly to crime, Dr. Tulchin's figures do show a definite relationship between certain types of crime and the intelligence of the offender. Thus, those who commit sex crimes were regularly the most stupid, those guilty of fraud regularly the most intelligent.

Many other conclusions of a higher degree of differentiation are drawn by the author on the basis of his carefully studied statistics. The book is a fundamental contribution to fact finding in a field where guesswork and small sampling have long been the rule. The inspiration of Herman Adler and the indefatigability of Simon Tulchin deserve the gratitude of scientific workers in psychiatry, psychology and criminology for this unassuming but very significant study.

Ways to Community Health Education. By Ira V. Hiscock, Professor of Public Health, Yale University School of Medicine. With the collaboration of Mary P. Connolly, Marjorie Delavan, Raymond S. Patterson and William H. F. Warthen. Cloth. Price, $3. Pp. 306, with illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1939.

This book, an important contribution to the literature of health education, is an illustrated manual—illustrated with actual examples of successful devices used in health education by all sorts of agencies engaged in this activity. Medical societies, dental societies, health departments, professional societies and voluntary health agencies have all contributed to this volume. Carefully edited by five prominent health educators in various fields, liberally documented and replete with ideas, practical advice and examples of effective use of the several mediums and methods in health education, it should find a permanent place on the desk of every person interested in health education, in health administration or in any activity in which communication with the public is essential. The book deals first with the mediums: radio, platform addresses, printed matter and displays. It then gives examples of effective use of these mediums in connection with diphtheria and smallpox control, infant welfare, sanitation, tuberculosis and syphilis control, and other applications to the usual community health program. The textual matter not only is packed with useful information but is distinctly readable.

The principal feature of the book is the illustrative material. Color plates, photographs, reduced facsimiles of printed matter and type samples are used effectively. They are gathered from health departments large and small, medical societies and academies of medicine, voluntary health agencies and governmental departments. They illustrate what can be done by showing what has been done and how it was done.

Heavy emphasis is placed throughout on the importance of the medical profession in health education, not only by frequently repeated advice about medical cooperation, but by citing examples and printing illustrations of how medical societies are regularly contributing to health education projects.

Evans' Recent Advances in Physiology. Revised by W. H. Newton, M.D., M.Sc., Reader in Physiology, University of London, University College, London. Sixth edition. Cloth. Price, $5. Pp. 490, with 109 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1939.

This useful book is composed of twelve essays on the present status of various topics in physiology. As in the previous editions there are discussions of the sex hormones, the mechanism of oxygen supply to the fetus, the transport of carbon dioxide in the blood, the metabolism of cardiac muscle, the secretion of urine, the nervous control of micturition, chemical transmission at nerve endings, and the spinal reflex. New chapters have been included on some aspects of the physiology of bone, the Carrel-Lindbergh perfusion apparatus, certain problems of carbohydrate metabolism, and the cortical control of muscular movement. The portion of the book which has been carried over from the previous edition has been revised and rearranged. The book is well illustrated, each chapter contains a select bibliography, and there is a suitable index. The volume may be considered as an advanced textbook on certain phases of physiology. There are a host of unsolved problems in each chapter. The book will be of great value to the serious student of physiology.

A Textbook of Medicine. By Various Authors. Edited by J. J. Conybeare, M.C., D.M., F.R.C.P., Physician to Guy's Hospital, London. Fourth edition. Cloth. Price, $4.75. Pp. 1,112, with 50 illustrations. Baltimore: William Wood & Company, 1939.

The 1939 edition offers to the student of medicine in essence an encyclopedia covering the entire field of medicine with extensive sections on neurology and psychiatry and a briefer section on dermatology. The work is popular in England, comparable to Osler or Cecil here, is reminiscent of Osler and McCrae in both organization and style and is written in an easily readable and understandable fashion. Noteworthy are the thorough manner in which each disease is discussed from the standpoint of symptomatology and diagnosis, the addition of pediatric aspects to discussions on the various infectious diseases, together with a chapter on gastrointestinal disorders of infancy, and a brief but adequate description of laboratory-clinical procedures when indicated as diagnostic measures. The section on neurology is probably sufficient to handle ordinary medical school needs in that subject, that on psychiatry is designed to give the student a familiarity with the subject. Common skin diseases are well handled in forty-eight pages on dermatology. Medicolegal aspects and instruction on proper insurance examinations are informatively discussed. Disadvantages lie in unfamiliar terminology as pertains to American students, and in the treatment of therapeutics. The names of proprietary preparations will not be recognized. Pharmaceutic nomenclature is confusing and dosages are entirely in the apothecary system. The most glaring fault lies in the unmodernized chapter on pneumonia, omitting entirely the all important strides that have been made in the last five years in the treatment of this condition. The old classification of three types and a fourth group is still adhered to. Serum is only briefly mentioned to be used only in types I and II. Sulfapyridine is not included. The important addition of sulfanilamide to our therapeutic armamentarium is almost entirely missed, being mentioned only briefly in the treatment of streptococcic septicemia and then in inadequate dosage. Old

traditional therapeutic measures, such as the use of whisky in pneumonia and frequent spinal drainages in epidemic meningitis, are still laid down perhaps too dogmatically as effective treatment adjuncts. We probably shall not agree with a course of treatment of early acquired syphilis that includes frequent interspersion of rest periods.

Injection Treatment of Hernia, Hydrocele, Ganglion, Hemorrhoids, Prostatic Gland, Angioma, Varicocele, Varicose Veins, Bursae, and Joints. By Penn Riddle, B.S., M.D., F.A.C.S., Assistant Professor of Clinical and Operative Surgery, Baylor University College of Medicine, Dallas. Cloth. Price, $5.50. Pp. 290, with 153 illustrations. Philadelphia & London: W. B. Saunders Company, 1940.

The increased popularity of the injection method of treatment is responsible for this authoritative work. Experience of many reliable workers showed that skepticism as to the safety and value of this method has been founded on theoretical misconceptions. On the other hand, the recent wave of enthusiasm over the injection method has created the impression that this treatment is not only a panacea for all types of hernias and varicose veins but also a simple office procedure which will save the patient time and money. The consensus at the present time is that the injection method has its field of usefulness, good results depending on an accurate differential diagnosis of the type of hernia, good judgment in selection of suitable cases, a thorough knowledge of the regional anatomy, proper technic of injection and, last but not least, a familiarity with fitting scientifically correct trusses. Too strong emphasis cannot be placed on the limitation of this method of treatment to men especially qualified in its use because there are definite inherent dangers in the procedure. The same remarks are applicable to the injection treatment of other conditions amenable to such therapy. Those wishing to employ this method are given in the book an excellent opportunity to acquaint themselves with the necessary details of treatment not only of hernias but also of varicose veins, hemorrhoids, hydrocele, varicocele, ganglion, angioma, bursae, joints and the prostate gland. The subject is covered completely and in a concise manner, the printing and illustrations are of a high quality. Only one omission has been noticed: among contraindications to injections of hernia, superficial cutaneous infections and the sliding hernia have not been mentioned. The book will undoubtedly receive a warm welcome from all interested in the subject.

Khimicheskaya priroda nervnogo vozbuzhdeniya v organizme cheloveka. [By] Prof. D. E. Alpern. [Nature chimique de l'excitation nerveuse dans l'organisme de l'homme.] Paper. Price, 7 rubles. Pp. 232, with 59 illustrations. Kharkov: Edition de l'Institut de médecine expérimentale d'Ukraine, 1939.

The author accepts as proved the existence in the human organism of neurohumoral substances, chemical factories of nervous stimulation. Sympathin and vagus substance have been demonstrated in experiment by many investigators. These substances are demonstrable in normal states when the vegetative nervous system is stimulated or when one of its functions is interfered with. The oculocardiac phenomenon of Aschner offers a convincing illustration. The presence of the vagus substance can be demonstrated in the blood when this phenomenon is positive. The classic experiments of Loewi and the contributions of Dale and Cannon demonstrated that formation of chemical substances accompanies the reflex activity of the vegetative nervous system under normal conditions. Some of these substances may act as vasodilators or as vasoconstrictors and cause an imbalance in a given vascular area. In the course of a number of years of study of tissue metabolism the author and his co-workers at the Ukrainian Institute of Experimental Medicine demonstrated the presence of chemical agents in a number of diseases in the pathogenesis of which alterations in the function of the vegetative nervous system play a part, such as gastric ulcer, bronchial asthma, spastic colitis and spontaneous gangrene. The substances are formed not only in the peripheral tissues but in the central nervous system as well. Thus acetylcholine-like substance has been found in the cerebrospinal fluid of man in the presence of a positive oculocardiac reflex and in an epileptic syndrome. Chemical substances are liberated as a result of the activity of the nervous system. In gastric ulcer and in spastic colitis, increased liberation of acetylcholine takes place in the gastric or the intestinal wall. The author further maintains the existence of synergism between the various chemical mediators and regulators. The existence of antagonistic mechanism can be likewise demonstrated. Such a counterregulator in the presence of accumulation of acetylcholine is cholinesterase, found in all the tissues of the human organism. The presence of acetylcholine can be demonstrated only after a preliminary introduction into the organism of physostigmine, which paralyzes the action of cholinesterase. The presence of the vagus substance stimulates the liberation of other antagonists such as epinephrine and sympathin. These investigations suggest the possibility of a new biologic method for the evaluation of the functional state of the vegetative nervous system. A consideration of the antagonistic factors permits a clearer understanding of the mechanism of a disease state and offers an opportunity for the study of the pathogenesis of the diseases of the vegetative nervous system. An extensive bibliography on this subject is appended as well as a summary in French.

The Therapeutics of Internal Diseases. Supervising Editor: George Blumer, M.A., M.D., David P. Smith Clinical Professor of Medicine, Yale University School of Medicine, New Haven. Associate Editor: Albert J. Sullivan, M.D., Chief Medical Officer, Gallinger Municipal Hospital, Washington, D. C. In Two Volumes. Cloth. Price, $20 per set. Pp. 872, with 1,042 illustrations. New York & London: D. Appleton-Century Company, Inc., 1940.

The introduction to these volumes by Dr. George Blumer should be made required reading for every medical student. He makes it clear that the chief duty of the physician is to treat the patient, but he also makes clear that an accurate diagnosis should, wherever possible, precede treatment. He points out that the physician is treating not the disease or the diseased organ but the patient. "The plan of treatment should be as simple as possible," he says, "and it is well to put down in black and white directions as to the extent of rest or exercise, the character and amount of food and fluids, means of obtaining sleep, the regulation of the emunctories and, of course, the dosage and times of administration of medicines." Interesting also is his comment regarding proprietary remedies. He says:

> If the practitioner of medicine is to develop therapeutic wisdom it is necessary that he should be aware of the pitfalls which beset the uncritical therapist and that he should develop a questioning attitude of mind. It is obvious from even a superficial perusal of medical literature that every promising new remedy goes through three stages. After its introduction it is used extensively and indiscriminately (stage of ballyhoo), then comes a stage of reaction during which numerous articles appear calling attention to its drawbacks and unpleasant side-effects, and finally a time comes when a true estimate of its value has been reached (stage of balance). In order to estimate the value of therapeutic agents it is necessary for the practitioner to adopt methods of appraisal and to view the whole subject with a scientific attitude of mind. Too often physicians form their estimation of the value of treatment on impressions, on the statements of the high powered detail men from drug houses, or on ill digested opinions of their colleagues; too often they are practicing a generation after graduation on the therapeutic ideas they learned in medical school.

These two volumes are of the symposium type, the first volume taking up methods of therapy, including not only nutrition and dietetics but also special headings such as electricity, radiotherapy, occupational therapy, serum therapy, vaccines, bacteriophage and various methods of administering therapy, including intravenous, intramuscular and spinal technics. The second volume then proceeds with pharmacology and uses of drugs, toxicology, and finally the methods of treatment in the various infectious diseases.

The contributors have all been selected for their prominence in the fields which they discuss and for the fact that all of them have contributed at one time or another to the scientific literature in those fields. The work is well edited, systematic in presentation, and up to date in its bibliography, and altogether a most useful contribution.

Diagnostic Signs, Reflexes and Syndromes Standardized. By Wm. Egbert Robertson, M.D., F.A.C.P., Visiting Physician, Medical Division, Philadelphia General Hospital, Philadelphia, and Harold F. Robertson, B.S., M.D., F.A.C.P., Instructor in Medicine, University of Pennsylvania, Philadelphia. Fabrikoid. Price, $3.50. Pp. 309. Philadelphia: F. A. Davis Company, 1939.

This is essentially a dictionary of all the usual signs and reflexes, many of them eponyms. It is a work of reference rather than one which would have any value for consecutive study. The work is obviously not all inclusive, and it is doubtful that any such book could be. The work should be of great aid to record librarians who must occasionally transfer eponymic designations into scientific nomenclature.

Biological Products. By Louis Gershenfeld, P.D., B.Sc., Ph.M., Professor of Bacteriology and Hygiene, and Director of the Bacteriological and Clinical Chemistry Laboratories at the Philadelphia College of Pharmacy and Science, Philadelphia. Cloth. Price, $4. Pp. 236, with illustrations. New York: Romaine Pierson Publishers, Inc., 1939.

This volume contains various series on biologic products heretofore published in various periodicals, including the source, preparation and manufacture of products. Furthermore, it embodies the composition, therapeutic and prophylactic uses and methods of standardization. The book should prove useful to those working in such a field, particularly allied to public health.

Faiths That Healed. By Ralph H. Major, M.D. Cloth. Price, $3. Pp. 290, with 30 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1940.

The relationship between faith and healing has given rise to various sects and beliefs associated with the curing of disease. Dr. Ralph Major has collected many of these and gives their histories and background. Here is an analysis of the growth of Christian science, of the background of Lourdes, the rise of witchcraft and many a similar subject. There are references to Mesmer, Quimby, Paracelsus and Zeileis. Strangely, the name of Coué does not appear in the index. Those who wish to trace the evolution of those who have exploited the relationship of body to mind will find in Dr. Major's book a well written account which will inspire thought and reflection.

Physicians' Fare. By C. G. Learoyd. Cloth. Price, $2. Pp. 302. New York: Longmans, Green & Co.; London: Edward Arnold & Co., 1939.

This is a collection of distinctly medical stories by a British physician who is, at the same time, a competent writer of short stories. Some of these stories have appeared in *Blackwood's Magazine* and in the *Evening Standard*, but most of them have appeared during the last three years in the *St. Thomas's Hospital Gazette*. They vary from the macabre as "A Nice Quiet Locum-Tenency" to the mysterious and the humorous. Particularly interesting are those which are a satire on psychoanalysis.

The Waiting Room. By Helen Irving Oehler. Cloth. Price, $1. Pp. 77. New York: Fortuny's, Publishers, 1940.

The author—a nurse—has collected reminiscences, anecdotes and personal observations of medicine and its practice. She talks about her operation and her experiences. She wants a doctor for the future who will be a specialist with a general practitioner's soul, and she knows that she does not want socialized medicine.

The Medical Record Visiting List or Physicians' Diary for 1940. Revised. Cloth. Price, $1.75 for 30 patients per week; $2 for 60 patients per week; $2.50 for 90 patients per week. No pagination. Baltimore: William Wood & Company, [n. d.].

For many years this has been a standard item whose annual rebirth merely needs recording. The present volume follows quite definitely the pattern of all previous issues, even so far as to continue the old lists of poisons, but fails to include innumerable new substances. Perhaps the book would be just as good with merely the blank pages suitable for records and the obstetric calendar and without the other obsolete contents.

The Medical Career and Other Papers. By Harvey Cushing. Cloth. Price, $2.50. Pp. 302. Boston: Little, Brown & Company, 1940.

Some of the best papers of Harvey Cushing are here collected, divided into those which deal with medical education and the social aspects of medical service and those which are excellent biographies. The notes concerning William Thomas Councilman and the Mayo Brothers are of current interest. Most significant of all these essays is the one called "Medicine at the Crossroads," first published in THE JOURNAL. The entire collection is as well written, as inspiring, a group of essays as could well be accredited to any one physician.

The New York Hospital Handbook of Applied Nutrition. Cloth. Price, $2. Pp. 136. New York, 1939.

This is a compilation of diets used in the New York Hospital and as such is a practical guide to routines which are common in many leading institutions.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Injury or Severance of Facial Nerve During Radical Mastoidectomy.—The defendant physician, an otologist or specialist in diseases of the ear, was employed by the plaintiff to treat a condition of her right ear. He found her suffering from a chronic infection of that ear and mastoiditis, an infection of the mastoid process of the temporal bone. To eradicate the infection the defendant, with the assistance of another otologist called in consultation by the patient, performed a radical mastoidectomy under ether anesthesia. After the operation a facial paralysis on the right side developed. While the patient was aware when she regained consciousness that her face felt "tight or drawn," she did not notice the paralysis until the third postoperative day when she looked into a mirror. The defendant continued to treat her until eight months later when he referred her to Dr. Semmes, a specialist in surgery of the nerves, and another otologist. The latter physicians performed an exploratory operation and found that the plaintiff's right facial nerve had been severed where it coursed through the facial canal in the region of the mastoid. The ear ceased to discharge pus three weeks later, and thereafter these two physicians performed a second operation and inserted a nerve graft. The facial paralysis persisted and the patient brought suit for malpractice against the defendant physician. From a judgment of the trial court directing a verdict in favor of the defendant, the plaintiff appealed to the court of appeals of Tennessee, western section.

The plaintiff contended that the defendant physician had performed the mastoidectomy in an unskilful and negligent manner, causing severance of the facial nerve and paralysis of the right side of her face; that he was negligent in not promptly disclosing to her the nature and cause of the paralysis and in assuring her that it was only a temporary condition, thus causing her to refrain from consulting other physicians until it was too late to correct the condition, and that because of his negligence the paralysis was rendered permanent. She testified that prior to the operation the defendant assured her that the procedure was comparatively simple and that the only risks involved were those of losing her hearing, which was already impaired, and the danger incident to taking a general anesthetic. According to her testimony, the defendant also assured her after the operation, on being asked concerning the facial paralysis, that the condition was temporary. On one occasion, she said, he informed her that it had been caused by iodine getting under the ether cone and on another occasion he told her that something was probably pressing against her facial nerve.

The medical testimony, said the court of appeals, was in accord that a radical mastoidectomy is a delicate operation requiring great skill and that the operation performed by the defendant had been skilfully done, except that the facial nerve, which is located in the immediate region of the mastoid, had been injured, probably cut. Dr. Semmes, the neurosurgeon, testified that paralysis of the facial nerve can be caused by swelling, inflammation or injury of the nerve. It was his opinion that in the instant case the facial nerve had probably been cut or so damaged by trauma as to cause it to slough. There was also unconflicting medical testimony that mastoiditis has a tendency to cause destruction of bone in the region of the mastoid process and that it was necessary for the defendant, in performing a radical mastoidectomy, to remove diseased bone in that region and to hollow out the entire mastoid region completely to relieve it of infection. Dr. Semmes testified, and his testimony was not controverted, that when the facial nerve is severed in the course of an operation there are two methods of repair available: (1) by direct suturing of the ends of the severed nerve if they can be approximated and (2) by grafting a section of nerve between the severed ends of the facial nerve when those ends cannot be brought together. He stated that at the time he performed the nerve graft there was a space of about one-half inch (1.25 cm.) between the severed ends of the

facial nerve. In his opinion, because of the location of the nerve in the facial canal, very little retraction of the ends of the nerve would have resulted from the time of the mastoidectomy to the time he was called in on the case. In the instant case the facial nerve could not be repaired by direct suture, because the severed ends could not be approximated, and so a nerve graft was indicated. He further testified that when a nerve is severed it is better to suture it at once, if that is possible, but if a graft is indicated it is better to wait until the infection has disappeared entirely. It was shown that after an operation for mastoiditis infection usually persists for some considerable time. In the judgment of the court, the effect of Dr. Semmes's testimony was that, even if a repair of the severed nerve had been attempted promptly after the mastoidectomy, a nerve graft would have been the only method of repair that could have been used, and it would not have been good surgery to do the grafting until the infection had disappeared.

In view of this unconflicting medical testimony, the court could not agree with the plaintiff's contention that the facial nerve was not located within the region of the mastoid but was outside of the field of operation and that therefore the injury to the facial nerve in the course of the operation performed by the defendant brought the case within the doctrine of res ipsa loquitur. That doctrine, said the court, is applicable where the cause of action is based exclusively on some negligent act of a physician which could not ordinarily result from a careful or skilful treatment or operation. In the instant case, however, medical testimony showed that the facial nerve, where it was injured by the operation, was located in the immediate region of the field of operation for mastoiditis and that in this type of operation there is always danger of injuring that nerve. Also, continued the court, uncontroverted expert medical testimony, which was properly admitted by the trial court and was not an invasion of the province of the jury, showed that it is possible for a surgeon in performing a radical mastoidectomy to injure or sever the facial nerve even when he performs that operation with the highest degree of care and skill.

It was the opinion of the court that the defendant's failure to use certain other instruments recognized by the medical profession did not raise, as the plaintiff contended, a presumption of negligence. Where it is shown, said the court, as the evidence in the instant case showed, that the instruments used in an operation are of a type approved for performing such an operation and the surgeon's technic is up to the recognized standard of efficiency and skill, failure to use other approved instruments does not constitute negligence.

In the judgment of the court, the trial court correctly held that expert medical testimony must be controlling in this case since the only questions involved were those of science. The court concluded, therefore, that the evidence in the case did not warrant the submission of the issues to the jury because any verdict by it would essentially have been based on pure speculation. Accordingly, the trial court's judgment of non-suit was affirmed.—*Calhoun v. Fraser (Tenn.), 126 S. W. (2d) 381.*

Injury to Eye Due to Hair Dye.—The plaintiff sustained injury to one of her eyes following the application of a dye, apparently a liquid for dyeing hair, which had been placed on the market by the defendant laboratories. She and her husband sued the laboratories and from an adverse judgment the plaintiffs appealed to the supreme court of New York, appellate division.

It was actionable negligence, said the supreme court, for the defendants to put on the market a dangerous and poisonous dye. To recover it was not necessary that the plaintiffs prove that the defendants had actually manufactured and distributed the dye. The court held, therefore, that the trial court had erred when it refused to instruct the jury that, if the evidence established that the liquid was dangerous and poisonous and that injury to the plaintiff's eye followed contact with it, it might be inferred, without further evidence as to how the particular bottle happened to contain a dangerous and poisonous substance, that such a condition could not have arisen without fault on the part of the employees of the defendants. Of course, if prior to the application of the dye the plaintiff as a patron was apprised, which was not shown by the evidence, that the liquid was dangerous and poisonous, then she would have assumed the risk involved. In the judgment of the court it was immaterial that the defendants had informed a so-called beautician that the dye contained a metallic salt and had also advised that patrons be instructed to keep their eyes closed during its application. The judgment of the trial court in favor of the defendant was therefore reversed and a new trial granted.—*Petzold et al. v. Roux Laboratories, Inc., et al. (N. Y.), 11 N. Y. S. (2d) 565.*

Dental Practice Acts: "License" and "Certificate" Synonymous.—The defendant was convicted of practicing dentistry without a "license" in violation of the dental practice act of Alabama, which provides: "Any person who practices dentistry in this state without having received a certificate as therein provided shall be guilty of a misdemeanor." He appealed to the court of appeals of Alabama and contended that the trial court had erred in overruling his demurrer to the indictment which, as he claimed, improperly charged that he had engaged in the practice of dentistry without a "license" instead of charging that he had engaged in such activities without a "certificate." Since the dental practice act used the words "license" and "certificate" interchangeably, in the judgment of the court of appeals the charge that the defendant "did practice or engage in the business of dentistry without a license contrary to law" was sufficient to put the defendant on notice that he had engaged in the practice of dentistry without having complied with the requirements of the dental practice act. The court of appeals, therefore, affirmed the judgment of conviction. The defendant's petition for a writ of certiorari to review the decision of the court of appeals was denied by the Supreme Court of Alabama.—*Dye v. State (Ala.), 188 So. 74; 188 So. 75.*

Society Proceedings

COMING MEETINGS

American Medical Association, New York, June 10-14. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

American Academy of Tuberculosis Physicians, New York, June 10-11. Dr. John Zarit, 1216 Republic Bldg., Denver, Secretary.

American Association for the Study of Neoplastic Diseases, Baltimore, June 20-22. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.

American Association of Genito-Urinary Surgeons, Skytop, Pa., June 20-22. Dr. Charles C. Higgins, 2020 East 93d St., Cleveland, Secretary.

American College of Chest Physicians, New York, June 8-10. Dr. Robert B. Homan Jr., P. O. Box 1069, El Paso, Texas, Secretary.

American College of Radiology, New York, June 12. Mr. M. F. Cahal, 540 North Michigan Blvd., Chicago, Executive Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 10-11. Dr. Albert F. R. Andresen, 88 Sixth Ave., Brooklyn, N. Y., Secretary.

American Gynecological Society, Quebec, Canada, June 17-19. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.

American Human Serum Association, New York, June 10. Dr. Maurice Hardgrove, 3321 North Maryland Ave., Milwaukee, Secretary.

American Medical Women's Association, New York, June 9-10. Dr. Elizabeth Parker, 1835 Eye St., Washington, D. C., Secretary.

American Physiotherapy Association, New York, June 23-28. Mrs. Eloise T. Landis, 2065 Adelbert Rd., Cleveland, Secretary.

American Proctologic Society, Richmond, Va., June 9-11. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.

American Radium Society, New York, June 10-11. Dr. William E. Costolow, 1407 South Hope St., Los Angeles, Secretary.

American Rheumatism Association, New York, June 10. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.

American Society for the Study of Allergy, New York, June 10-11. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Tex., Secretary.

American Society of Clinical Pathologists, New York, June 6-10. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Urological Association, Buffalo, N. Y., June 24-27. Dr. Clyde L. Deming, 749 Howard Ave., New Haven, Conn., Secretary.

Association for Research in Ophthalmology, New York, June 11. Dr. Conrad Berens, 35 East 70th St., New York, Secretary.

Association for the Study of Internal Secretions, New York, June 10-11. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Maine Medical Association, Rangeley Lakes, June 23-25. Dr. F. R. Carter, 22 Arsenal St., Portland, Secretary.

Medical Library Association, Portland, Ore., June 25-27. Miss Anna C. Holt, 25 Shattuck St., Boston, Secretary.

Montana, Medical Association of, Bozeman, June 18-20. Dr. Thomas F. Walker, 206 Medical Arts Building, Great Falls, Secretary.

Pacific Northwest Medical Association, Spokane, Wash., July 10-13. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.

West Virginia State Medical Association, White Sulphur Springs, July 29-31. Mr. Joe W. Savage, Public Library Bldg., Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

38:319-462 (March) 1940. Partial Index

Induction of Tumors by Injected Methylcholanthrene in Mice of a Strain Especially Sensitive to Carcinogenic Agents Applied to Skin and Comparison with Some Other Strains. Georgiana M. Bonser, Leeds, England.—p. 319.

Initiation and Growth of Tumors: Introduction: I. Effects of Underfeeding. A. Tannenbaum, Chicago.—p. 335.

Tumors Produced in Hamsters by Benzpyrene. L. Halberstaedter, Jerusalem, Palestine.—p. 351.

Epidermoid Carcinoma of Stomach. M. M. Scheffer and A. B. Falk, Chicago.—p. 359.

Mixed Epitheliома of Back Arising from Daily Application of a Phenol and Ergot Ointment. J. B. Stevens and J. L. Callaway, Durham, N. C.—p. 364.

Tumor Inhibition by Antitumor Nuclei Serum. C. A. Stoneburg and Frances L. Haven, Rochester, N. Y.—p. 377.

Inactivation of Melanophore Hormone by Cancer Serum. J. H. Last and E. M. K. Geiling, Chicago.—p. 380.

Estrous Cycle and Associated Phenomena in Strain of Rats Characterized by High Incidence of Mammary Tumors Together with Observations on Effects of Advancing Age on These Phenomena. J. M. Wolfe, Ethel Burack and A. W. Wright, Albany, N. Y.—p. 383.

American Journal of Diseases of Children, Chicago

59:693-930 (April) 1940

*Tetanus in Childhood, with Special Reference to Treatment. H. F. Dietrich, Beverly Hills, Calif.—p. 693.

Sulfapyridine in Treatment of Pneumonia in Infants and Children: Report on Fifty-Eight Treated Patients and Fifty-Six Controls. J. P. Scott, Philadelphia.—p. 711.

Focal Epileptogenic Lesions of Birth and Infancy: Report of Eight Cases. W. Penfield and H. M. Keith, Montreal.—p. 718.

*Obesity in Childhood: III. Physiologic and Psychologic Aspects of Food Intake of Obese Children. Hilde Bruch, New York.—p. 739.

Hypo-Amino-Acidemia in Children with Nephrotic Crises. L. E. Farr and D. A. MacFadyen, New York.—p. 782.

*Giardiasis. P. V. Véghelyi, Budapest, Hungary.—p. 793.

Hands and Wrists of the Diabetic Child: Roentgenologic Study. Isabel K. Bogan, Boston.—p. 805.

Study of 240 Breast Fed and Artificially Fed Infants in the St. Louis Area: I. Comparison of Prophylactic Antirachitic Effects of 135 and 200 Unit Irradiated Evaporated Milks, 200 Unit Irradiated Fresh Milk and Human and Nonirradiated Evaporated Milk Fortified with 800 to 1,000 Units of Vitamin D as Viosterol. Edith C. Robinson, St. Louis.—p. 816.

Tetanus in Childhood.—Dietrich reviews twenty-eight cases of tetanus treated at the Children's Hospital from 1921 to 1939. Twelve of fifteen children treated between 1921 and 1932 died, but only one of the thirteen treated from 1933 to 1939 died. Most of the deaths in the first group and the only death in the second group occurred as a direct result of treatment. The improved rate of mortality in the second group was due to the more judicious use of serum and to the increasing dependence on sedatives. Refinement of serums in the last few years probably aided in reducing the number of severe reactions. A few of the children in the second group had severe reactions to serum but survived. One thousand five hundred units of antitoxin offers insufficient protection to the child with a compound fracture, but it apparently protects one with a minor wound. In the last eighteen years no child who received antitoxin for such a wound has been admitted to the hospital with tetanus. Most cases of tetanus seen in a children's hospital arise from wounds of such a trivial nature that the physician and often the mother are not consulted by the child. The further reduction of morbidity from tetanus must lie in the active immunization with tetanus toxoid of large groups of children. Every child who died had an extremely severe reaction immediately following serum intravenously or intrathecally. The immediate lethal factor was demonstrated in six necropsies to be medullary edema. Because of the rapid reaction following intravenous or intrathecal administration of serum, it seems reasonable to assume that the edema was the result of some reaction to the serum. In four cases in which lumbar punctures were done before and from eight to twenty hours after the introduction of tetanus antitoxin into the subarachnoid space an acute inflammatory process was evident. The second group of thirteen cases emphasizes the relation between the route by which the serum is administered and the severity of reaction. The four patients given serum intrathecally and intravenously had severe reactions. They differed from the fatal ones only in a quantitative degree. Four patients were given intramuscular injections and they were the only ones not to show untoward reactions. Because time is an important factor, the intravenous is theoretically the ideal route for the administration of at least the first dose. It is better to assume the risk of slow effect and to give the antitoxin intramuscularly. One may give one dose of antitoxin and epinephrine intravenously and follow it by intramuscular administrations to maintain the concentration in the blood. An untried plan which may prove to be ideal, suggested by Hyland, is to obtain human tetanus antitoxin by immunizing donors with tetanus toxoid. One could give at first a single dose of human serum intravenously without fear of an untoward reaction. The concentration of antitoxin in the blood could be maintained safely by daily doses of orthodox tetanus antitoxin intramuscularly. Sedatives are of great value and are indicated before other therapeutic or diagnostic procedures are undertaken. The three important phases in the treatment are to spare the patient with adequate sedation and quiet surroundings, to provide a continuous but moderate supply of antitoxin to neutralize (preferably by intramuscular injection) any new toxin liberated and to supply reasonable amounts of fluid and nourishment during the first three to seven critical days. Seconal (sodium propylmethylcarbinylallylbarbiturate) for sedation has proved almost ideal in the three cases in which the author has used it.

Obesity in Childhood.—Bruch obtained information regarding the eating habits of 136 obese children from 2 to 13 years of age. The parents of 80 per cent of the children recognized that the food intake was larger than average. In the remaining 20 per cent it was described as normal or small, but the "normal" and "small" were not so much an estimate of the child's food intake as of the parents' exaggerated expectations as to what the children should eat. In all cases food intake was in better agreement with the rate of gain in weight than with the excess in weight. A preponderance of starchy food was shown. The emotional development of forty of the patients and their mothers was studied. The majority of the children had been exposed to prolonged overprotection. They exhibited signs of immature behavior not only in their eating habits but in other respects. For many obese children deprived of other outlets and satisfying contacts, the intake of food had gained an inordinate importance. Prolonged overprotection of 35 per cent of the children was partly explained by the fact that they were only children, and another 35 per cent were youngest children. In many instances a great difference in age or the death of another sibling accentuated the peculiarity of the family position. Increased desire for food frequently became manifest only after some upsetting experience: fear for the integrity of the body and of suppressed aggression. The maternal attitude was sometimes shaped by deprivation during her own childhood and rejection of the child. In all instances the offering and receiving of food represented an important emotional tie in the mother-child relation. Only 5.6 per cent of the patients came spontaneously for treatment of obesity. This group showed the best degree of cooperation. The poorest cooperation was shown by the children who came to the clinic with the definite expectation of receiving glandular injections for correction of the excess weight. A hypothesis is advanced that emotional experiences call into play functional disturbances of the hypothalamus which may be of importance in the large group of obese patients in whom no organic lesion can be detected.

Giardiasis.—Véghelyi studied the digestion and intestinal absorption of seventeen children infected with Giardia. Apart from the infection with Giardia lamblia no pathologic condition was found which could be held responsible for the symptoms, the anemia and the retarded development. Fat absorption was

markedly defective and only a small portion of the normal urinary pigment was excreted. The condition was attributed to the mechanical effect of the parasites covering the wall of the intestine and rendering it impermeable. The parasites almost cover the active surface of the intestine. The degree of impairment is probably proportional to the area of intestinal surface rendered inactive. If this surface is small, capacity for absorption may remain intact and no symptoms will arise. This may explain the fact that "healthy carriers" without symptoms are not rare. Infection may be severe enough to paralyze extensive intestinal surfaces and lead to a condition similar to atrophy from inanition. This state is further aggravated by the fact that, besides foodstuffs, other important substances, such as bile and vitamins, are not absorbed and by the fact that a great part of the available supply of calcium and magnesium is expended in binding the excess of free fatty acid. In this respect the condition resembles celiac disease. Twelve of the seventeen children were treated, but systematic reexaminations of only eight could be made. Acetarsone and acridine compounds were administered and no special diet. All eight were freed from the parasites, recovery taking place in from three and a half to seven weeks. Treatment was continued until cysts could no longer be detected in the stools after a provocative test with sodium sulfate on three consecutive days. Normal absorption was demonstrated after the treatment. Utilization of the fat returned to normal, the urinary pigment appeared in normal amounts, the anemia improved and body growth proceeded promptly. Improvement was gradual and was manifest on the fourth or fifth day after treatment was begun.

American J. Obstetrics and Gynecology, St. Louis

39:365-548 (March) 1940. **Partial Index**

Reduction of Unwarranted Operative Incidence in Obstetrics. S. A. Cosgrove, Jersey City, N. J.—p. 365.

*Clinical Aspects of Pelvic Endometriosis. F. L. Payne, Philadelphia. —p. 373.

Asphyxia of the Fetus and the Newborn Infant: Study of Clinical and Pathologic Changes Produced by Intra-Uterine Asphyxia Due to Placenta Praevia and Consideration of Methods to Prevent or Minimize Fetal Anoxemia. S. H. Clifford, Boston.—p. 388.

Control of Cancer in Women from the Medical Point of View, with Special Reference to Schiller Test and Colposcope. R. E. Watkins, Portland, Ore.—p. 394.

Estrogen and Progestin Metabolism in Pregnant Women, with Especial Reference to Preeclamptic Toxemia and Effect of Hormone Administration. G. Van S. Smith and O. W. Smith, Brookline, Mass.—p. 405.

Theca Cell Tumors of Ovary: Report of Ten Cases. M. B. Dockerty, Rochester, Minn.—p. 434.

*Heart Disease and Pregnancy: Eight Years' Experience. J. Jensen, C. Wegner, E. H. Keys Jr. and H. R. Smith, St. Louis.—p. 443.

Adrenal Cortex in Treatment of Nausea and Vomiting in Pregnancy. J. Kotz and M. S. Kaufman, Washington, D. C.—p. 449.

Bilateral Ovarian Dermoids Complicating Pregnancy Treated by Bilateral Oophorectomy. C. J. Andrews, R. B. Nicholls and Aurelia Gill Nicholls, Norfolk, Va.—p. 453.

*Studies on Preservation and Use for Transfusion of Placental Blood. C. S. Fine, R. L. Alter and A. Baptisti Jr., Baltimore.—p. 462.

Histologic Effect of Progesterone on Hyperplastic Endometriums. G. E. Seegar, Baltimore.—p. 469.

Use of Neutral Diet and Hydration in Treatment of Toxemias of Pregnancy. R. R. de Alvarez, Ann Arbor, Mich.—p. 476.

Acute Gonococcic Perihepatitis: Report of Five Cases. W. M. Brunet, Chicago.—p. 481.

Subcutaneous Implantation of Compressed Crystalline Theelin Pellets in Treatment of Menopausal Cases: Preliminary Report. H. G. Bennett Jr., G. Biskind and J. Mark, Baltimore.—p. 504.

Treatment of Abnormal Menstrual Function with Estrogenic and Gonadotropic Hormones. A. Jacoby and M. G. DerBrucke, New York.—p. 509.

Treatment of Cervicitis During Pregnancy. A. G. King and Roselyn Touff, Cincinnati.—p. 520.

Use of Antiseptic Oil in Treatment of Vaginal and Cervical Infections. W. A. Reed, New Orleans.—p. 531.

Pelvic Endometriosis.—Slow growth, limited invasive properties and dependence on ovarian stimulation characterize endometriosis as a benign process despite its widespread dissemination. No other nonmalignant growth is so capable of such widespread involvement as is endometriosis. Payne found, in a study of 307 patients with this condition, 343 major lesions and innumerable minor lesions not considered in the analysis. The ovaries were the most frequent sites of endometriosis (64 per cent). Unilateral ovarian involvement constituted 36 per cent of the lesions and bilateral 28 per cent. Widespread infiltration of the culdesac constituted 25 per cent of the massive lesions. This was frequently associated with endometriosis in other localizations, particularly the ovaries. The process extended into the rectovaginal septum producing a nodular infiltration resembling a malignant condition of the rectum. Rectal digital and proctoscopic examinations clarify the diagnosis, as endometriosis does not infiltrate the rectal mucous membrane as does a malignant growth. The fallopian tubes were moderately frequent sites of endometriosis, 3.2 per cent, and endometriomas of tubal stumps accounted for 1.1 per cent of them. Other areas of implantation were the external surface of the uterus, the broad ligament, the umbilicus, the cervix and a laparotomy scar, a bladder and an appendix. Any portion of the intestinal tract in or near the pelvic cavity may be involved. A characteristic feature of endometriosis is its association with other pelvic pathologic changes or disorders which overshadow both the symptoms and signs of the adenomas. Fifty-nine patients presented endometriosis alone, while the remaining 248 patients had a total of 367 complicating conditions. The following may be mentioned in order of frequency: uterine myomas, fibroids, perisalpingitis or periophoritis, uterine retrodisplacement, cervical stenosis and ovarian neoplasms. Endometriosis is a disease of the menstrual life, with an incidence of approximately 80 per cent between the fourth and sixth decades. Its chief symptoms are those of local pain, alterations in the menstrual and reproductive processes and dysfunction of the contiguous organs. Treatment, routine observation, surgical intervention or irradiation are determined by the severity of symptoms, the patient's age and the operative removability of the major lesions. Conservatism, particularly in young patients, is justified by the results: From 90 to 95 per cent were completely or partially relieved of symptoms, 8 per cent required further treatment and 9 per cent had subsequent pregnancies.

Heart Disease and Pregnancy.—Jensen and his associates studied 108 obstetric patients with cardiovascular disease. The study aimed to determine to what extent care extended to this class of patient has affected maternal and infant death rates. Ninety-nine of the 108 women had rheumatic, seven congenital and two syphilitic heart disease. The patients with rheumatic heart disease presented various valvular lesions. Eight women died of heart disease. Of these cases only two belong to the regular antepartum series. There were no deaths among the patients with organic heart disease who followed instructions and received adequate antepartum care from the beginning of pregnancy. Heart disease has been an important cause of death in St. Louis Maternity Hospital. Of forty-four maternal deaths, six could be traced directly to valvular disease of the heart or its immediate complications. The six died within six months of delivery. The fact that no cardiac deaths occurred in properly managed pregnant women leads the authors to believe that while some cardiac patients should not become pregnant or should have their pregnancies interrupted if they do, the majority can be carried successfully to term if given adequate antepartum care. The treatment of these cases has been conducted along generally accepted lines.

Preservation and Use of Placental Blood.—Fine and his collaborators conclude from their studies that placental blood is suitable for transfusion in adults provided it can be collected sterilely and in sufficient quantities and can be satisfactorily preserved. Placental blood could apparently be collected and preserved sterilely, but the subsequent transfusions were accompanied by a high percentage of reactions. A comparative study of different preservative solutions suggested that 1.5 per cent sodium citrate in physiologic solution of sodium chloride is the most desirable. Further bacteriologic studies, using special culture mediums, revealed that a high percentage of the collected blood was contaminated. Several modifications of the method of collection did not eliminate this contamination. Transfusion reactions could not be correlated with bacterial contamination or other detectable factors, such as hemolysis, type of preservative or time of storage. The authors believe that the biologic significance of placental blood is somewhat greater than that of adult blood. Theoretically its use for transfusion is attractive, but the technical difficulties encountered in collection and sterile preservation are sufficient to make its use impracticable under the present state of resources.

American Journal of Pathology, Boston

16:103-236 (March) 1940

Cytologic Studies on Globi in Leprosy. E. V. Cowdry, St. Louis.—p. 103.
Pathogenesis of Herpes Simplex Virus Infection in Chick Embryos. Katherine Anderson, Nashville, Tenn.—p. 137.
Pathogenesis of Syphilitic Optic Atrophy: Preliminary Study with Report of Case. S. H. Epstein, Boston.—p. 157.
Transmission of Lymphogranuloma Venereum to Guinea Pig. A. W. Grace and Florence H. Suskind, New York.—p. 169.
*Intracystic Papilloma of Breast. O. Saphir and M. L. Parker, Chicago. —p. 189.
Pathologic Anatomy of Cellophane Perinephritis. I. Graef, New York, and I. H. Page, Indianapolis.—p. 211.
Histogenesis of Hepatic Cirrhosis in Chronic Food Selenosis. R. D. Lillie and M. I. Smith, Washington, D. C.—p. 223.
Tuberculosis Involving Pulmonary Valve. H. R. Gilmore Jr., Washington, D. C.—p. 229.
Silver Carbonate Staining Method for Oligodendrocytes and Microglia for Routine Use. J. C. McCarter, Montreal.—p. 233.

Intracystic Papilloma of Breast.—From the microscopic study of fifty-eight tumors of the breast grossly designated as papillomas, Saphir and Parker distinguished three types: the fibrous (pseudoglandular), the glandular and the transitional cell papilloma. Combinations of these types occur, particularly of the fibrous and the glandular types. The fibrous type consists of a stalk of connective tissue. Ramifications of the stalks may fuse with the production of pseudoglandular structures. This is the most common type of papilloma. Because of such pseudoglandular structures, this special subgroup may be designated as the pseudoglandular type. The glandular type is apparently formed by an extension of neighboring hyperplastic or adenomatous periductile acini into a duct or cyst; the epithelial cells of the duct enclose the invaginated acini. Both the fibrous and glandular types are benign tumors which do not recur. They often extend into the neighboring ducts but cannot be regarded as precancerous. The transitional cell type of papilloma morphologically is a benign tumor. It may recur after removal and some of the recurrent tumors may show morphologic evidence of a malignant change. It resembles the papilloma of the urinary bladder which, although morphologically benign, is sometimes classified as carcinoma grade 1 principally because of recurrences which prove to be malignant. Intracystic papillomas of the breast are as a rule multiple. The multiplicity of these transitional cell papillomas may be explained on the basis of multiplicity of origin or by implantations of tumor cells in neighboring ducts. Such implants do not necessarily indicate a malignant condition but may be compared to certain benign ovarian tumors which occasionally produce implantations on the peritoneal surface. Careful microscopic examination of all papillomas of the breast is important as far as the prognosis and the surgical procedure are concerned. For fibropapilloma and glandular papilloma, not only is excision of the tumor indicated but also inclusion of a circumscribed region of the breast surrounding the tumor, because often these tumors are multiple. There is no danger that carcinoma may develop on the basis of these lesions. Simple mastectomy is indicated for transitional cell papilloma, as these lesions, although microscopically benign, may possess an inert degree for malignant changes not recognizable by present staining methods. The prognosis in these cases after mastectomy seems good.

American Journal of Physiology, Baltimore

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Body Build and Oxygen Metabolism at Rest and During Exercise. C. C. Seltzer, Cambridge, Mass.—p. 1.
Duration of Insulin Action. P. O. Greeley, Los Angeles.—p. 17.
Respiratory Adjustments to Oxygen Lack in Presence of Carbon Dioxide. D. B. Dill and N. Zamcheck, Boston.—p. 47.
Climatic Effects on Volume and Composition of Blood in Man. H. C. Bazett, F. W. Sunderman, J. Doupe and J. C. Scott, Philadelphia.—p. 69.
Slow Adaptations in Heat Exchanges of Man to Changed Climatic Conditions. A. C. Burton, J. C. Scott, B. McGlone and H. C. Bazett, Philadelphia.—p. 84.
Climatic Effects on Cardiac Output and Circulation in Man. J. C. Scott, H. C. Bazett and G. C. Mackie, Philadelphia.—p. 102.
Comparison of Some Respiratory and Circulatory Reactions of Athletes and Nonathletes. E. C. Schneider and C. B. Crampton, Middletown, Conn.—p. 165.
Injury to Ileal Mucosa by Contact with Distilled Water. C. Dennis, Minneapolis.—p. 171.
Masculinization of Female Rats Treated with Testosterone Propionate. K. E. Paschkis, H. Shay, J. Gershon-Cohen and S. S. Fels, Philadelphia.—p. 191.

American Journal of Psychiatry, New York

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Psychiatric Approach to Treatment of Epilepsy. S. Cobb, Boston.—p. 1009.
*Further Experiences with Use of Sodium Diphenyl Hydantoinate in Treatment of Convulsive Disorders. H. H. Merritt and T. J. Putnam, Boston.—p. 1023.
Comparative Study of Effectiveness of Dilantin Sodium and Phenobarbital in a Group of Epileptics. J. Weinberg and H. H. Goldstein, Chicago.—p. 1029.
Follow-Up Study of Nonluetic Psychotic Patients with Abnormalities in Spinal Fluid. P. Solomon, R. S. Schwab and L. Maletz, Boston.—p. 1035.
Dementia Paralytica Accompanied by Manic-Depressive and Schizophrenic Psychoses: Significance of Their Coexistence. D. Rothschild, Foxborough, Mass.—p. 1043.
Partial Bilateral Frontal Lobectomy: Psychopathologic Study: Case. I. C. Nichols and J. M. Hunt, Providence, R. I.—p. 1063.
Psychoses with Myxedema. R. M. Crowley, Washington, D. C.—p. 1105.
*Clinical Observations in Insulin Treatment of Schizophrenia: Preliminary Report. J. P. Frostig.—p. 1167.
*Insulin Therapy of Schizophrenia in the Elgin State Hospital, with Special Reference to Relapses and Failures. Gert Heilbrunn and Ruth Sternlieb, Elgin, Ill.—p. 1203.
Neuropsychiatric Disorders Occurring in Cushing's Syndrome (Pituitary Basophilism). N. S. Schlezinger, Philadelphia, and W. A. Horwitz, New York.—p. 1213.
Hereditary and Environmental Factors in Causation of Manic-Depressive Psychoses and Dementia Praecox. H. M. Pollock and B. Malzberg, Albany, N. Y.—p. 1227.

Dilantin Sodium for Convulsive Disorders.—Merritt and Putnam report the results with dilantin sodium of treating 267 patients refractory to other types of therapy. The patients have been treated for from two to twenty-two months. Their ages varied from 2 to 68 years. The duration of seizures varied from less than one year to more than forty years. One hundred and sixty-four of the patients were subject to only one type of attack at the time dilantin therapy was instituted: 124 had grand mal, twenty-one petit mal while nineteen had psychic equivalent or psychomotor attacks. The remaining 103 suffered from a combination of the three types. The results agree in general with those previously reported. Dilantin sodium was most effective in controlling "psychic equivalent" attacks (twelve of nineteen completely relieved), next most effective in preventing "grand mal" attacks (seventy-four of the 124 patients were completely relieved) and least effective in the "petit mal" attacks (six of twenty-one were completely relieved). Of twenty other patients with psychic equivalents associated with grand mal attacks twelve were completely relieved, of 103 with grand mal attacks associated with petit mal or psychic equivalents sixty-three were completely relieved, and such relief occurred in thirty-four of eighty-three patients with petit mal associated with grand mal seizures. The authors have not noticed that the therapeutic effectiveness of the drug becomes less with prolonged administration. They feel, however, that it is too early to draw any conclusions as to the possible development of tolerance to the therapeutic action of the drug as none of their patients have been under treatment for longer than two years. Dilantin sodium was generally well tolerated by most patients. There have been no fatalities and no very serious reactions. The most troublesome symptoms in regulating the dosage were those referable to the gastrointestinal and central nervous systems. Less frequent but more serious symptoms were those referable to the skin (toxic dermatitis) and gums (hyperplasia).

Insulin Treatment of Schizophrenia.—The quality and time of appearance of symptoms following 6,587 insulin treatments exhibited, according to Frostig, a definite and constant order of succession. The progression of symptoms is determined phylogenically and moves in an order inverse to the phylogenic age of the layers. At first the activity of the cortex becomes suppressed, releasing the syndromes of the basal ganglions. As time progresses activity of the basal ganglions ceases, giving way to a release of the midbrain. Finally centers in the medulla oblongata are released. If the signs of this release last beyond the time at which pinpoint pupils are observed and the corneal reflex disappears, a protracted shock may be expected. Release of the medulla oblongata has to be, therefore, considered the biologic border of the therapeutic application of the insulin effect. The time of appearance and disappearance of symptoms depends on the size of the dose of insulin. Increase of the dose speeds up and decrease of the dose slows the rate of progression. Sensitization is another factor affecting the time of

appearance of the symptoms. The dose does not influence the sequence of the symptoms. In order to adapt the insulin effect on the brain to therapeutic purposes, the author proposed a standard time of five hours. The pharmacologic shock has to be managed so that medullary symptoms (tonic extensor spasms, parasympathetic syndrome) occur in the last half of the fifth hour. The shock seems to be therapeutically sufficient if the tonic phase lasts no less than one hour.

Insulin Therapy of Schizophrenia.—Heilbrunn and Sternlieb state that of 315 schizophrenic patients treated with insulin during the last three years 72 per cent of those with psychoses of less than seven months recovered and 10 per cent had social remissions. The respective figures for patients ill from seven to eighteen months are 35 and 20 per cent, while for patients ill more than eighteen months it is 10 per cent. A similar recovery rate was obtained among patients who had not responded to previous metrazol therapy. There were 15 per cent relapses in the first two groups. Simultaneous treatment with insulin and metrazol did not benefit patients who had failed to respond previously to either form of therapy. No fatalities, serious complications or spinal fractures were encountered. Epileptiform seizures occurring in 33 per cent of the patients had no therapeutic effect. Relapses were especially high among those patients who had had previous spontaneous remissions. The chance of another recovery decreases with each relapse. No definite criteria for a future relapse could be established from the previous patient's history or the symptomatology during the psychosis. Relapses occurred most frequently within six months of completion of treatment. A practical prognostic help was found in the patient's reaction to intravenous sodium amytal. Schizophrenic patients who show little or no response to sodium amytal are apt to fail to improve under insulin, whereas a large percentage of those with a lucid period following sodium amytal respond favorably.

American Journal of Tropical Medicine, Baltimore

20:169-344 (March) 1940. **Partial Index**

Mechanism of Immunity to Metazoan Parasites. W. H. Taliaferro, Chicago.—p. 169.

Research on Helminth Diseases and Public Health Progress. W. W. Cort, Baltimore.—p. 183.

Complement Fixation Reaction for Amebiasis: Comparative Tests Performed by Two Laboratories. T. B. Magath and H. E. Meleney, with technical assistance of Margaret Hurn and Frances Jones, Nashville, Tenn.—p. 211.

"Short Term" Treatment of Malarial Infections with Quinine. C. F. Craig, San Antonio, Texas.—p. 239.

Some Characteristics of Artificially Induced Vivax Malaria. M. F. Boyd, Tallahassee, Fla.—p. 269.

Influence of Sporozoite Dosage in Vivax Malaria. M. F. Boyd, Tallahassee, Fla.—p. 279.

First Case of Tinea Imbricata Caused by Trichophyton Concentricum Blanchard 1896, Reported from Guatemala. H. Figueroa and N. F. Conant, Durham, N. C.—p. 287.

Human Rabies, with Special Reference to Virus Distribution and Titer. C. N. Leach and H. N. Johnson, Montgomery, Ala.—p. 335.

Annals of Internal Medicine, Lancaster, Pa.

13:1567-1790 (March) 1940

*Specific Treatment of Pneumococcic Pneumonias: Analysis of Results of Serum Therapy and Chemotherapy at Boston City Hospital from July 1938 Through June 1939. M. Finland, W. C. Spring Jr. and F. C. Lowell, Boston.—p. 1567.

Relations Between Age and Weight and Dosage of Drugs. W. T. Dawson, Galveston, Texas.—p. 1594.

*Adenylic Acid in Human Nutrition. T. D. Spies, W. B. Bean and R. W. Vilter, Cincinnati.—p. 1616.

Variation of Blood Pressure with Skeletal Muscle Tension and Relaxation: II. The Heart Beat. E. Jacobson, Chicago.—p. 1619.

Limitations of Renal Function Determination. L. C. McGee and J. E. Martin Jr., Elkins, W. Va.—p. 1626.

Clinical Studies in Renal Disease: III. Acidosis in Chronic Glomerulonephritis. E. R. Marzullo, Brooklyn.—p. 1638.

Azorubin S Test of Liver Function: Evaluation, with Comparative Study of Bromsulphalein and Hippuric Acid Tests. D. H. Rosenberg and S. Soskin, Chicago.—p. 1644.

The Problem of Rheumatism and Arthritis: Review of American and English Literature for 1938 (Sixth Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz.; J. A. Key, St. Louis, and C. McEwen, New York.—p. 1655.

Specific Treatment of Pneumococcic Pneumonias.—Finland and his associates report the results obtained with serums and with drugs separately or in combination in the treatment of cases of pneumonia admitted to the Boston City Hospital from July 1938 to July 1939. Of 211 patients given specific serum twenty-eight died, of 129 receiving serum and sulfapyridine thirty-one died, of the 225 treated with sulfapyridine forty died and of 472 treated without the serum or sulfapyridine 135 died. In the last group there were seventy-three cases in which the bacteriologic diagnosis was made after death. With these cases excluded the mortality amounted to 15.5 per cent. All the patients were more than 12 years of age. Both horse serum and rabbit serum were effective; the latter was more concentrated and was used in the poorer risks. Rabbit serum gave fewer allergic reactions than horse serum. Severe untoward reactions from either serum or sulfapyridine were infrequent. Sulfanilamide was not effective when given alone or as a supplement to serum therapy. The authors recommend the following treatment for pneumococcic pneumonia: 1. Blood culture and sputum typing should be done as soon as clinical diagnosis of pneumonia is made. 2. Sulfapyridine therapy is to be instituted at this time. 3. Specific serums are to be given to patients having the worst prognosis as soon as the type of pneumococcus is determined. 4. Serum should be given to all patients exhibiting no definite improvement after twenty-four to thirty-six hours of sulfapyridine therapy.

Adenylic Acid in Human Nutrition.—Spies and his co-workers find that in dietary vitamin deficiencies (pellagra, beriberi, riboflavin, vitamin A and vitamin B_6 deficiency) in addition to lack of the specific substance (nicotinic acid, thiamine hydrochloride, riboflavin, oleum percomorphum, carotene in oil or vitamin B_6) the diet is still deficient in another substance or substances when the specific one is supplied. Riboflavin, in addition to its specific effect on clinical riboflavin deficiency, has been shown to be beneficial to certain pellagrins in relapse, and since so many of these "specific" deficiencies are clinically interrelated it is possible that the same general biochemical system or systems may be disturbed. Adenylic acid is a constituent of the pyridine dinucleotides, coenzymes I and II, and is widely distributed in nature. It is intimately concerned with carbohydrate and protein metabolism. The authors investigated the properties of adenylic acid by administering it to eight normal persons and to fifteen persons with mixed deficiency disease. Some of the symptoms of mixed vitamin deficiency were relieved by adenylic acid. This compound, in some cases, may act in a manner similar to riboflavin in increasing the effectiveness of nicotinic acid in pellagrins in relapse. This not only gives further evidence of the multiple and mixed nature of dietary deficiency diseases in human beings but also suggests that they are the result of dysfunction of certain fundamentally related enzyme reactions. Because of the severe reactions produced by intravenous injections of all preparations of adenylic acid the authors do not recommend that the compound be administered to human beings until further studies have been made. Pellagrins in relapse were benefited by nicotinic acid and adenylic acid. Six patients with malnutrition with intense burning of the oral mucous membranes but with no diagnostic evidence of pellagra were relieved following treatment with adenylic acid alone.

Annals of Otol., Rhinol. and Laryngology, St. Louis

49:1-288 (March) 1940. **Partial Index**

A Talk to House Officers and Pharyngomaxillary Approach to Tip of Temporal Bone. H. P. Mosher, Boston.—p. 3.

Methods for Producing Local Anesthesia for Tonsillectomy, Intranasal Operations and Operations on Paranasal Sinuses. H. I. Lillie, P. N. Pastore and L. H. Mousel, Rochester, Minn.—p. 38.

Chronic Progressive Deafness, with Special Reference to Estrogenic Substances: Further Contribution. G. Selfridge, San Francisco.—p. 52.

Significance of Hoarseness. W. Wells, Washington, D. C.—p. 99.

Carcinosarcoma of Larynx. I. Frank and M. Lev, Chicago.—p. 113.

Experimental Hyperparathyroidism and Otosclerosis. E. C. Slaughter, Boston.—p. 130.

Tuberculous Ulcerogranuloma of Trachea and Bronchi. M. C. Myerson, New York.—p. 177.

Etiology and Treatment of Seventh Nerve Paralysis. C. H. McCaskey, Indianapolis.—p. 199.

Report on Use of Urea in Suppurative Conditions About Ear. A. P. Seltzer, Philadelphia.—p. 219.

Carcinoma of External Auditory Canal, Middle Ear and Mastoid. R. J. Bowman, Beverly Hills, Calif.—p. 225.

New Labyrinthine Reaction: "The Waltzing Test." C. Hirsch, New York.—p. 232.

Type of Deafness Which Responds to Fistulization of Otic Capsule. N. Canfield, New Haven, Conn.—p. 248.

Archives of Internal Medicine, Chicago

65:661-872 (April) 1940

Sudden Occlusion of Coronary Arteries Following Removal of Cardiosensory Pathways: Experimental Study. C. G. McEachern, G. W. Manning and G. E. Hall, Toronto.—p. 661.
Progress in Chemotherapy of Bacterial and Other Diseases, with Special Reference to Prontosils, Sulfanilamide and Sulfapyridine. J. A. Kolmer, Philadelphia.—p. 671.
Effect of Sulfanilamide on Fibrinolytic Activity of Hemolytic Streptococci. L. E. Hines, A. H. Hoover and E. Graff, Chicago.—p. 744.
Blood Pressures in Aortic Coarctation: Study of Pulse Contours Taken by Direct Method. R. A. Woodbury, E. E. Murphey and W. F. Hamilton, Augusta, Ga.—p. 752.
*Studies in Dystrophia Myotonica: II. Clinical Features and Treatment. J. J. Waring, A. Ravin and C. E. Walker Jr., Denver.—p. 763.
Formation of Urine. J. G. Edwards, Buffalo.—p. 800.
Effect of Sulfanilamide and Sulfapyridine on Hemoglobin Metabolism and Hepatic Function. C. J. Watson and W. W. Spink, with technical assistance of Ruth L. Evarts, Minneapolis.—p. 825.
Liver and Biliary Tract: Review for 1939. C. H. Greene, New York, and E. Farrell, Brooklyn.—p. 847.

Dystrophic Myotonia.—Waring and his associates state that contrary to general impression dystrophic myotonia is fairly common, is frequently unrecognized and is of great general medical interest. The thirteen cases they report were encountered between 1935 and 1938 by investigating families of patients previously recognized to have the disease. The degenerative changes are so widespread that the ophthalmologist, neurologist or internist may be called on to diagnose and to treat it. From the hereditary features of the disease it appears to be due to a dominant factor first manifested by no signs or by slight signs, notably the cataract. In families in which cataract occurs, its onset at an earlier age in succeeding generations is evidence of a defective gene. Finally there is an evolution of the complete syndrome of dystrophic myotonia in one generation. This is followed at an earlier age in succeeding generations, until in one generation its onset occurs before maturity, after which the disease ceases to appear in that family. It seems probable that the defective gene appears first in a family by mutation. Its onset is insidious and it progresses slowly. Degenerative signs are present for many years before they attract the patient's attention. Therefore the time of its onset is apt to be underestimated by many years. Cataract (twelve of the thirteen patients) is often the earliest evidence of the condition. The prolonged contraction characteristic of myotonia is easily distinguished from simulating conditions by the fact that the difficulty in relaxing the contracted muscle becomes less with each repetition of the contraction, myotonia is not painful, myotonia increases in degree (up to a limit) with increase in the force of contraction and the contractions which show myotonia are voluntarily produced. Contractions have been markedly decreased by the administration of quinine and to a less extent by epinephrine, and by calcium intravenously. The atrophy of myotonia is characterized by involvement of muscles of the face, the sternocleidomastoids, the muscles of the forearm, the quadriceps and the dorsiflexors of the foot. One or more of these muscles usually show the initial involvement, but when the condition is moderately advanced the entire group is more or less affected. Atrophy may affect muscles which have or have not been myotonic. The endocrine system shows evidences of generalized and often marked involvement. Testicular atrophy is frequent. Ovarian involvement is indicated by menstrual irregularities and infertility. The thyroid is often enlarged and of increased firmness. The basal metabolic rate is usually low. The conception of the pituitary as the master regulator of the endocrine system suggests primary pituitary hypofunction as the fundamental cause. Five patients with fairly advanced dystrophia myotonica had hypotension and four low blood pressures. The disease must be differentiated from congenital myotonia, various progressive muscular atrophies and dystrophies and other diseases producing presenile cataracts and endocrine disorders. Its hereditary nature is of the greatest diagnostic importance. Cataract associated with dystrophic myotonia is adequately treated by operation. Myotonia can be adequately treated by quinine. The latter does not, however, influence muscular weakness and atrophy, the source of the greatest disability. The greatest improvement in weakness and atrophy of one patient resulted from anterior pituitary extract, but the extract failed to produce any effect in two. Patients believed aminoacetic acid, epinephrine and epinephrine with pilocarpine to be beneficial, but objective signs of improvement were not evident. These drugs may have prevented a progression of the condition. Testosterone propionate was of questionable value.

Archives of Ophthalmology, Chicago

23:689-898 (April) 1940

Concretions in Lacrimal Canaliculus Caused by Actinomyces. A. Hagedoorn, Amsterdam, Netherlands.—p. 689.
Treatment of Ocular Syphilis. O. L. Levin and H. T. Behrman, New York.—p. 693.
Iritis Due to Bacteria and Bacterial Toxins Associated with Dental Sepsis: Experimental Production in Laboratory Animals by Administration of These Toxins. A. A. Siniscal, Bloomfield, N. J.—p. 705.
Acceptance of Weak Cylinders at Paradoxic Axes. B. Friedman, New York.—p. 720.
Tumor of Third Ventricle with Resulting Chronic Internal Hydrocephalus: Clinical History Over Period of Seventeen Years. E. A. Shumway, Philadelphia.—p. 727.
Primary Tumors of Optic Nerve (Phenomenon of Recklinghausen's Disease): Clinical and Pathologic Study with Report of Five Cases and Review of Literature. F. A. Davis, Madison, Wis.—p. 735.
Impression Technic for Contact Glasses. A. E. Town, New York.—p. 822.
Vortex-Shaped Dystrophy of Cornea. F. J. Bloch, New York.—p. 825.
Postscript on Image Expansion by Foveal Clivus. G. L. Walls, Detroit.—p. 831.
Operation on Ocular Muscles: Few Points in Operative Technic. M. Freiberger, New York.—p. 833.
Some Basic Principles of Dark Adaptation. R. McDonald, Philadelphia.—p. 841.

Archives of Physical Therapy, Chicago

21:129-192 (March) 1940

Effect of Natural Carbonated Baths on Rate and Amplitude of Pulse and Blood Pressure. S. Dorrance and W. S. McClellan, Saratoga Springs, N. Y.—p. 133.
Spa Therapy in Rheumatic Diseases. E. M. Smith and C. H. Lutterloh, Hot Springs National Park, Ark.—p. 141.
Physical Treatment of Arthritis. F. H. Krusen, Rochester, Minn.—p. 144.
Combined Coagulation and Ionization of Cervical Erosions and Endocervicitis. D. Derow, New York.—p. 154.
Psychologic Observations with Reeducation in Case of Multiple Sclerosis. W. Marshall, Appleton, Wis.—p. 164.
Newer Method of Physical Therapy in Complications of Diabetes. J. T. Beardwood Jr., Philadelphia.—p. 171.

California and Western Medicine, San Francisco

52:151-202 (April) 1940

*Carcinoma to Spleen: Metastases. P. H. Guttman, Sacramento.—p. 156.
Hard of Hearing Problems. F. L. Rogers, Long Beach.—p. 158.
Diagnostic Value of Gastroscopy. A. L. Cohn, San Francisco.—p. 161.
Sulfanilamide in Urologic Infections. B. Silver, Hollywood.—p. 166.
Gonorrhea: Its Treatment by Artificial Fever and by Fever Therapy in Combination with Sulfanilamide. E. Belt and A. W. Falkenberg, Los Angeles.—p. 169.
Clinical Aspect of Electrically Produced Gamma Rays: Three Important Units. A. Soiland, Los Angeles.—p. 172.
Use of Papaverine Hydrochloride in Mesenteric Embolism. L. J. Madsen, Santa Monica.—p. 176.
Granuloma Venereum Involving Rectum and Colon. W. Crane and H. S. Kimball, Oakland.—p. 177.

Metastasis from Breast Carcinoma to Spleen.—Guttman reports an instance of an unusually massive metastasis from a scirrhous carcinoma of the breast to the spleen in a woman of 55 who had noticed a lump in the breast three days prior to hospitalization. Trauma to the breast occurred one year ago and was followed by a swelling. The breast was amputated radically. The postoperative course was rapidly downhill. Eight months after operation there was fluid in the chest, and x-ray examination revealed a metastatic growth in the right lung. Despite extensive irradiation the patient died twenty-two months postoperatively. Metastases to numerous organs were of the gross nodular type. A small and a large nodule were present in the spleen. The metastasis was considered hematogenic in origin, as there was no evidence of involvement of the capsule or of extension along the efferent lymphatics. The mammary tumor was a rapidly growing, medullary carcinoma. Microscopic examination of the small nodule from the spleen showed a neoplasm, consisting of alveolar clusters and broad strands of epithelial cells compactly arranged. These were separated by a stroma consisting of highly vascular, loose connective tissue infiltrated in places with lymphocytes. The cells contained hyperchromatic nuclei which varied markedly in size.

Mitotic figures were numerous. The cytoplasm was basophilic and moderate in amount. Marked degenerative changes were present in the tumor cells in the center of the growth. There was a moderate lymphocytic and plasma cell infiltration at the periphery. The structure of the larger nodule was similar. No structural changes of the pulp of the spleen were to be seen. There were nodular metastases to the lungs, pleura, liver, mediastinum and kidneys.

Delaware State Medical Journal, Wilmington

13:39-56 (March) 1940

Ophthalmology and Its Relation to Industry. G. H. Cross, Chester, Pa.—p. 39.
Sacralization. H. G. Hadley, Washington, D. C.—p. 46.

Journal of Experimental Medicine, New York

71:423-584 (April) 1940

Growth Inhibition by Substances in Liver. A. M. Brues, Y. Subbarow, Elizabeth B. Jackson and J. C. Auh, Boston.—p. 423.
Studies of Infectious Unit of Myxoma. R. F. Parker, Cleveland.—p. 439.
Cross Reactions of Egg Albumin Serums. K. Landsteiner and J. van der Scheer, New York.—p. 445.
Antibody Formation in Tuberculous Lesion at Site of Inoculation. J. O. Westwater, New York.—p. 455.
Cancers Deriving from Virus Papillomas of Wild Rabbits Under Natural Conditions. J. G. Kidd and P. Rous, New York.—p. 469.
Angiotonin Activator, Renin and Angiotonin Inhibitor and Mechanism of Angiotonin Tachyphylaxis in Normal, Hypertensive and Nephrectomized Animals. I. H. Page and O. M. Helmer, Indianapolis.—p. 495.
Type Specific Antigens, M and T, of Matt and Glossy Variants of Group A Hemolytic Streptococci. Rebecca C. Lancefield, New York.—p. 521.
Significance of M and T Antigens in Cross Reactions Between Certain Types of Group A Hemolytic Streptococci. Rebecca C. Lancefield, New York.—p. 539.
Group Specific A Substances: IV. Substance from Hog Stomach. K. Landsteiner and R. A. Harte, New York.—p. 551.
Protein Consumption and Restoration of Lost Organ Tissue. T. Addis and W. Lew, San Francisco.—p. 563.
Amino Acids and Hemoglobin Production in Anemia. G. H. Whipple and Frieda S. Robscheit-Robbins, Rochester, N. Y.—p. 569.

Journal Industrial Hygiene & Toxicology, Baltimore

22:111-156 (April) 1940

Chronic Arsine Poisoning Among Workers Employed in Cyanide Extraction of Gold: Report of Fourteen Cases. F. M. R. Bulmer, H. E. Rothwell, Toronto; S. S. Polack and D. W. Stewart, Sudbury, Ont.—p. 111.
*Health Hazards of Electric and Gas Welding: (1) Review of Literature; (2) Results of Examination of 286 Welders; (3) Preventive Measures. J. A. Britton and E. L. Walsh, Chicago.—p. 125.
Constant Dust Feeding Device for Laboratory Use. C. E. Williams and W. P. Battista, New York.—p. 152.

Hazards of Electric and Gas Welding.—Britton and Walsh examined 1,000 welders. Of these 286 had five or more (average nine) years of experience in electric or gas welding. Each roentgenogram of the chest was examined by three physicians. A sick benefit association offered a record of sickness disabilities requiring absence from work for one week or longer of 189 welders. In many instances, serial roentgenograms made over several years were available. No significant change or advance in abnormal markings was observed. The roentgenograms of 186 were normal. Increased hilar shadows or trunk and linear markings were present in forty-seven. These observations are nonspecific and would be found in any critical survey in about the same percentage under similar environmental conditions. Mottling or stippling of the pulmonary fields was present in twenty-four. In at least five of these it could be ascribed to other causes (dust). The remainder gave no history of exposure to dust. Excluding the five, records of sickness of sixteen men show that they have had no serious disability sickness in the last ten years and eight have had no complaints. One has slight albuminuria, two complain of cough and four have lost time within ten years (one in 1933 for four and one-half weeks because of pneumonia, one for two weeks in 1936 because of rheumatism, one for two weeks in 1935 and three weeks in 1936 because of an infected foot and one for forty-six weeks in 1936 because of bronchitis). There has been no recurrence of symptoms. One man lost two weeks because of grip in 1932 and now has a cough and chronic tuberculosis. The group with the most advanced lung changes has no more frequent or severe sickness than any group. Of the remainder examined roentgenologically, fourteen men have signs of pleurisy, four large or multiple calcified foci, three rather extensive tuberculous changes, four widespread calcific deposits of a mycotic or disseminated healed tuberculous infection, two signs of emphysema and one each had a widened aorta, enlarged heart shadow, fractured rib and calcified pleura. These changes probably have no causal relationship to occupation. Only thirty-four of the 286 showed any abnormality or offered any physical complaint, not one of which was of a disabling degree. Twenty-two of the complaints were related to the respiratory system. The disabilities of the 189 welders were of the nature expected in any group of workers. One hundred and thirty-three have had no disability due to sickness lasting one week or more. In 1937 fourteen welders had sickness causing an absence from work for an average of 5.7 weeks each, while for the general employee group the average disability was 5.5 weeks each. The health of the welders compares favorably and perhaps is better than that of other groups in the same manufacturing unit. The hazards common to all types of welding include heat, light rays, electric shock and burns, irritating or poisonous gases, fumes or dust. When proper safeguards are taken for their control they should offer no serious menace to health.

Journal of Nervous and Mental Disease, New York

91:417-556 (April) 1940

Grasping—"Forced" and "Nonforced." I. Bieber, New York.—p. 417.
Electrocardiographic Studies After Treatment with Insulin and Metrazol Shock. J. R. Sonenthal and A. A. Low, Chicago.—p. 423.
Study of Hemato-Encephalic Barrier by Bromide Method, Before and After Insulin Therapy: Normal Range of Permeability; Correlation of Permeability Quotients with Psychomotor Activity. M. M. Kessler, New York.—p. 428.
Pneumothorax in Treatment of Pulmonary Tuberculosis in Psychotic Patients. E. F. Dombrowski, F. S. Rankin and H. H. Goldstein, Chicago.—p. 449.
Myoclonus Epilepsy with Primary Optic Atrophy. M. P. Rosenblum and M. Herman, New York.—p. 456.
Behavior Problems in Children from Homes of Followers of Father Divine. Lauretta Bender and M. A. Spalding, New York.—p. 460.

Minnesota Medicine, St. Paul

23:221-310 (April) 1940

*Apical Lung Tumors or So-Called Superior Pulmonary Sulcus Tumors. H. J. Moersch, H. C. Hinshaw and I. H. Wilson, Rochester.—p. 221.
Early Gastrointestinal Carcinoma. G. Earl, St. Paul.—p. 226.
Recurrent Myxosarcoma of Right Inguinal Region: Report of Case. L. K. Buzzelle and R. B. Tudor, Minneapolis.—p. 230.
Adenomyomas. W. G. Benjamin, Pipestone.—p. 231.
Greetings from the Alumni. O. J. Hagen, Moorhead.—p. 236.
Vertigo. W. T. Wenner, St. Cloud.—p. 241.
Sympathetic Neuroblastoma: Report of Case. O. B. Fesenmaier, New Ulm.—p. 244.

Apical Lung Tumors.—Moersch and his associates state that among the admissions to the Mayo Clinic from January 1928 to Dec. 31, 1937, there were only thirteen cases of superior pulmonary sulcus tumor with all of the essential features of the disease present. Four other cases had all the features but Horner's syndrome. These four cases tend to disprove the contention that the tumor is a distinct clinical entity. Thirteen of the patients were men and four were women. The youngest was 19 years of age and the oldest 72; the majority were middle aged. The left apex was involved in twelve cases. Intermittent pain, worse at night, was the earliest and most annoying symptom. It usually began near the shoulder and tended to spread down the arm and round the scapula on the homolateral side. Before Horner's syndrome develops the condition is often mistaken for "rheumatism," neuritis or even angina and, when the pain is suspected of being of "rheumatic" origin, tonsillectomy for relief is not an uncommon event. The condition is rapidly progressive and disabling. Careful x-ray examination of the thorax is of utmost diagnostic importance. Hemoptysis is infrequent. Tissue for microscopic examination was obtained from nine of the thirteen cases and from three of the four cases in which Horner's syndrome was absent. Necropsy was performed on two from each group and all observations were regarded as those of primary carcinoma of the bronchus with metastases to other organs. Three of the thirteen typical cases were explored surgically and in each instance the tumor was inoperable because of invasion of the vertebrae or ribs. Tumor tissue from two of the three cases was reported as adenocarcinoma, grade 4. Biopsy of the supraclavicular lymph nodes overlying the apical

tumor from four of the typical cases and from one of the atypical cases revealed that four were cases of adenocarcinoma and one a chondroma. The prognosis of an apical pulmonary tumor is grave. The majority of such patients under the authors' observation were dead within six months of the initial examination. No successful form of treatment has been found. Occasionally, temporary relief was obtained from roentgen therapy. The authors conclude that the so-called superior pulmonary sulcus tumor is not a distinct clinical entity but a lesion situated in the apex of the lung, giving rise to a characteristic train of symptoms designated by Pancoast as the superior pulmonary sulcus syndrome. The tumor that most commonly produces this symptom complex is a primary carcinoma of the bronchus.

Missouri State Medical Assn. Journal, St. Louis

37:135-188 (April) 1940

Leprosy. G. B. Tuttle, St. Louis.—p. 135.
*Sulfanilamide in Treatment of Scarlet Fever. G. S. Bozalis and H. L. Barnett, St. Louis.—p. 137.
Neurologic Anatomy and Physiology of Bladder and Its Clinical Application in Urology. D. K. Rose, St. Louis.—p. 142.
Maternal Mortality in Missouri. H. F. Parker and Madge Proctor, Jefferson City.—p. 152.
Hyperemesis Gravidarum: Endocrine Approach to Early Treatment. P. F. Fletcher, St. Louis.—p. 155.
Tuberculosis and Pregnancy. S. H. Snider, Kansas City.—p. 157.
Pregnancy and Diabetes. G. M. Powell, Springfield.—p. 159.
Hidden Liabilities in Maternal Welfare. G. F. Pendleton, Kansas City.—p. 161.
Obstetric Progress: Abruptio Placentae. C. F. Marshall, Kansas City.—p. 164.

Sulfanilamide in Scarlet Fever.—Bozalis and Barnett treated 300 cases of scarlet fever with sulfanilamide administered orally in a dose of 0.2 Gm. per kilogram of body weight (1½ grains per pound) for the first twenty-four hours, in six divided doses, decreased one half after twenty-four hours for the remainder of the period of drug treatment. Children weighing over 88 pounds (40 Kg.) and adults received 8 Gm. in the first twenty-four hours in six doses, after which they received 4 Gm. daily in six doses. Blood concentrations between 5 and 10 mg. per hundred cubic centimeters were thus obtained within a few hours and maintained throughout the course of treatment. The drug was continued after the temperature had been normal for two days and when there was a definite improvement in the appearance of the throat. There was an apparent reduction in the number of septic complications which might have been further reduced had the drug been continued longer. When complications did occur, a prompt response to further sulfanilamide treatment took place. The authors performed tonsillectomies on forty of convalescing patients with no reactions despite the fact that these were carried out during the winter and spring months and in the presence of active infections. This was ascribed to administration of sulfanilamide before and after the operation. Scarlet fever antitoxin in combination with sulfanilamide was given to thirty-nine patients with extreme degrees of toxicity. There were no deaths.

New England Journal of Medicine, Boston

222:563-610 (April 4) 1940

Oxygen in Treatment of Lobar Pneumonia. A. M. Burgess, Providence, R. I.—p. 563.
*Atypical Bronchopneumonia of Unknown Etiology, Possibly Due to Filtrable Virus. M. E. Murray Jr., Cambridge, Mass.—p. 565.
Sulfanilamide Therapy in Chronic Undermining Streptococcic Ulcer: Report of Case. K. B. Lawrence, Boston.—p. 573.
Clinical Significance of Oral Lesions in Acute Leukemia. W. C. Maloney, Boston.—p. 577.
One Stage Lobectomy in Bronchiectasis. M. D. Tyson, Hanover, N. H.—p. 579.
Recent Advances in Biochemistry and Therapeusis of Potassium Salts. J. H. Talbot and R. S. Schwab, Boston.—p. 585.

Atypical Bronchopneumonia.—Murray during the last four years observed a mild form of pneumonia among the students at Harvard University. It was especially prevalent during the academic year 1938-1939, eighty-one cases having been cared for in the Stillman Infirmary and thirty-nine cases reported by family physicians. The records of 132 infirmary patients were studied. The disease began as a simple acute infection with minimal respiratory symptoms but usually with the early appearance of cough and later some degree of expectoration. The chill, chest pain, bloody sputum and prostration of pneumococcic lobar pneumonia were as a rule absent. A pulmonary lesion, most often beginning at the hilus and advancing outward toward the lateral chest wall or the diaphragm, was demonstrable early in the illness by x-ray examination. Physical signs were minimal. Mild dulness to percussion and some diminution in breath sounds, followed by the appearance of coarse rales on the fifth, sixth or seventh day, were the usual observations. The course was mild, with return of the temperature to normal in from five to seven days. The pulse was only moderately accelerated, rarely rising above 90 or 100. The respiratory rate was almost invariably normal. Severe prostration was present in a few cases, but tympanites, delirium and other evidences of critical illness were not seen. The leukocyte count was either normal or slightly elevated, with from 70 to 75 per cent polymorphonuclear cells. In about one third of the cases there was a rise in the leukocytes during the latter part of the illness, without the appearance of complications to explain it. Complications were few and mild. The majority of sputum specimens examined contained no pneumococci; somewhat less than half showed a pneumococcus, usually one of the higher types. Sputum cultures yielded a variety of organisms, and a small number of blood cultures were all negative. Attempts to isolate a filtrable virus were unsuccessful. A short convalescence was the rule. No deaths occurred. The author believes that this infection represents a separate disease entity but does not believe that it is a new disease. It does not appear to be related to the common cold or to epidemic influenza. Epidemiologic observations indicate that it is contagious and suggest an incubation period of from seven to eleven days. Bacteriologic studies fail to incriminate any of the known bacteria as etiologic factors. This negative evidence, plus certain characteristics of the clinical picture, suggests that this is a virus disease. So far, however, no positive evidence in favor of this impression has been obtained.

222:611-656 (April 11) 1940

*Acute Mechanical Obstruction of Small Bowel: Its Diagnosis and Treatment. L. S. McKittrick and S. P. Sarris, Boston.—p. 611.
Prevention of Diabetes Mellitus: Clinical Lecture. R. Fitz, Boston.—p. 623.
*Engorgement of Pulmonary Veins by Extension of Cardiac Enlargement Posteriorly: Relation to Postural Dyspnea in Cardiac Patients. W. D. Reid, Portsmouth, N. H.—p. 627.
Gastro-Enterology. C. M. Jones, Boston.—p. 634.

Acute Mechanical Obstruction of Small Bowel.—This is the fourth report on patients with acute mechanical obstruction of the small bowel operated on at the Massachusetts General Hospital and is based on 136 cases treated during the last fifteen years. McKittrick and Sarris emphasize the following principles in the management of these cases: The degree of dehydration and chemical imbalance must be evaluated and methods instituted for relief. Blood transfusions may be indicated for patients with strangulation obstruction. A double lumen Miller-Abbot or similar tube should be passed immediately, to be left in whether or not operation is undertaken. Immediate operation is indicated in any case examined within twenty-four hours after the onset of symptoms. Early operation should be done on a patient seen in the second twenty-four hours. Delayed or nonoperative treatment is indicated in the absence of definite signs of strangulation obstruction in any patient seen later than forty-eight hours after the onset of symptoms, or in any patient over 60 years of age, unless the obstruction is of less than twenty-four hours' duration and the patient is in good condition, without distention. If conservative treatment is instituted, the following routine should be followed: serial abdominal films at from twelve to twenty-four hour intervals, in order to follow the progress of the tube and the degree of distention; bi-daily white cell counts, and frequent abdominal examination, at least every four or six hours, with the examiner particularly alert for the development of local tenderness or of rebound tenderness. If decompression cannot be accomplished by intubation, and laparotomy under general or spinal anesthesia seems too hazardous, the distended bowel should be drained by inserting a catheter in a distended loop under procaine anesthesia. No attempt at exploration should be made at this time. If decompression is successfully accomplished and normal bowel action is reestablished, an operation of election at the same hospital admission for a good risk patient should be

given serious consideration. The authors feel that since the obstructing mechanism is probably still present, and since 26 per cent of their patients have given a history of previous attacks, the risk of lysis of the point of obstruction is less than that of future obstruction, unless the patient is assured of competent surgical care within the first twenty-four hours of any subsequent attack.

Engorgement of Pulmonary Veins.—Reid presents reasons in support of the conception that compression of the pulmonary veins and of the lungs by extension of cardiac enlargement posteriorly is a more valid explanation of engorgement of these vessels and of dyspnea of cardiac origin than is the formerly accepted theory. There exist similarities to what is known as the postmediastinal syndrome in which dyspnea is a prominent symptom. Patients with heart disease were closely questioned regarding the occurrence of dyspnea while they were in bed. Their answers were correlated with the fluoroscopic evidence of the backward extension of their hearts. Patients with proved disease of the heart and usually with some degree of cardiac insufficiency, but whose dyspnea was unrelated to posture, served as controls. There were fifty-three patients in all—seventeen with postural dyspnea and thirty-six without. The former were all found to have marked extension of the heart backward into the retrocardiac space, whereas but one of the control cases showed marked encroachment on the retrocardiac space. The author does not assert that these prove that engorgement of the pulmonary veins is caused by mechanical pressure exerted on their walls by backward extension of an enlarged heart. It seems reasonable to suggest that physicians should not limit their thoughts to the heart in cardiac patients with dyspnea. Some therapeutic possibilities come to mind. It might be advisable to pay more attention to the posture of the patient. There are patients in whom elevation on a bed rest gives but partial relief to dyspnea but who will obtain greater ease in a forward leaning posture. The author adjusted a hospital bed table in front of such patients and found that it lessened their dyspnea. Crowding of the available space in the thorax by accumulations of fluid is an evident reason for increased dyspnea. An increased application of and a readiness to repeat thoracentesis have increased the comfort of patients. It seems reasonable to suggest the performance of the Brauer operation.

New York State Journal of Medicine, New York

40:461-614 (April 1) 1940

Value of Tuberculin Skin Tests in Pediatric Practice. P. W. Beaven, Rochester.—p. 467.
Diet and Deficiency Disease in Clinical Medicine. T. T. Mackie, New York.—p. 475.
Bronchial Asthma: New Use for an Old Remedy. G. S. King, Bay Shore.—p. 485.
Sulfapyridine in Treatment of Pneumonia. R. L. Cecil, E. A. Lawrence and E. Tolstoi, New York.—p. 488.
Urologic Complications in Gynecology. A. J. Murphy, New York.—p. 495.
*Spontaneous Pneumothorax: Industrial Experience with Twenty-Five Cases. J. L. Norris, Rochester.—p. 504.
Institutional Convalescent Care for Surgical Patients. I. S. Ravdin, Philadelphia.—p. 507.
Convalescent Care: Perpetual Challenge. E. H. L. Corwin, New York.—p. 513.
Clinical Aspects of Syphilis Control. W. A. Brumfield Jr., Albany.—p. 519.
Subacute Bacterial Endocarditis Case: New Method of Treatment. K. Lippmann, New York.—p. 524.
Treatment of Corporeal Carcinoma with Radium. H. Strauss, Brooklyn.—p. 529.

Spontaneous Pneumothorax.—According to Norris, spontaneous pneumothorax occurring in active, symptom-free persons is benign and but rarely associated with tuberculosis. He reports twenty-five cases seen at Kodak Park during the last six years. He believes that the condition should be designated as benign spontaneous pneumothorax. It occurs, as a rule, in persons between the ages of 19 and 35 years. Two thirds of his patients were underweight. All except one were males. Spontaneous pneumothorax should be suspected in the presence of acute pain in the chest, upper part of the abdomen, or back. The acute onset at times may suggest acute cholelithiasis, renal calculus, angina pectoris or perforation of a peptic ulcer. Spontaneous pneumothorax is seldom associated with any usual physical exertion and is never symptom free. Diagnosis may be made from physical signs, but the condition can be ruled out only by roentgenograms taken in forced expiration. This is the only way in which small collections of air can be demonstrated. Fluoroscopy is of little use except in marked cases. Usually the spontaneous pneumothorax requires no treatment beyond bed rest. Occasionally in the "ball valve" or tension type it is necessary to remove some air by paracentesis. Tuberculosis should be suspected but is only rarely associated with this condition. Even in the presence of roentgenograms indicating healed tuberculosis foci, long periods of hospitalization are an unnecessary hardship. Tuberculin reactions are useful. Tuberculin tests made on fifteen of the twenty-five patients were negative in seven, mildly positive in six and positive in two cases. Loss of time ranged from none to five months, the longest disability being in a patient with a suggestive apical scar. The average lost time was 3.84 weeks.

Ohio State Medical Journal, Columbus

36:349-480 (April) 1940

Diagnosis and Treatment of Jaundice. T. E. Newell and M. T. Hoerner, Dayton.—p. 365.
Treatment of Certain Allergic Manifestations as Medical Emergencies. J. W. Thomas, Cleveland.—p. 372.
Leukocytosis Following Sulfapyridine Administration: Report of One Case. W. T. Wilkins Jr. and W. W. Weis, Piqua.—p. 376.
Fever Therapy at the Ohio Girls' Industrial School at Delaware: Preliminary Report. D. S. Cowles, Ostrander.—p. 378.
Rupture of Cavernous Hemangioma as Cause of Death in Newborn Infant: Report of Case. C. C. Kissinger, E. Sternfeld and S. D. Zuker, Toledo.—p. 383.
Sulfapyridine in Treatment of Pneumonia: Observations in 100 Cases. J. Rosenfeld and A. M. Rosenblum, Youngstown.—p. 385.
Pneumonia Cures. M. A. Blankenhorn, Cincinnati.—p. 389.

Public Health Reports, Washington, D. C.

55:485-530 (March 22) 1940

Using Tests as a Medium for Health Education. M. Derryberry and A. Weissman.—p. 485.
Siphonaptera: Notes on Two California Species. W. L. Jellison.—p. 489.
Ornithodorus Hermsi: Feeding and Molting Habits in Relation to Acquisition and Transmission of Relapsing Fever Spirochetes. G. E. Davis and Mary E. Walker.—p. 492.
Relapsing Fever: Data Implicating Ornithodorus Hermsi as Vector in Northern Idaho. C. B. Philip and G. E. Davis.—p. 504.

55:531-572 (March 29) 1940

Attempts to Produce Tumors in Rats by Feeding Crude Wheat Germ Oil Made by Prolonged Ether Extraction. H. Blumberg.—p. 531.
Factors Influencing Carcinogenesis with Methylcholanthrene: III. Effect of Solvents. M. B. Shimkin and H. B. Andervont.—p. 537.
Preservation of Infectious Agents of Some of the Rickettsioses. N. H. Topping.—p. 545.
Housing and Health Relationships Reexamined. B. Marquette.—p. 547.

55:573-618 (April 5) 1940

Neglected Opportunities for Teamwork in County Health Department Practice. J. O. Dean and Evelyn Flock.—p. 573.
Studies of Sewage Purification: XII. Metabolism of Glucose by Activated Sludge. C. C. Ruchhoft, J. F. Kachmar and O. R. Placak.—p. 582.
*Infectious Equine Encephalomyelitis in the United States in 1939.—p. 601.

55:619-666 (April 12) 1940

Geographic Distribution of Diphtheria Mortality in the United States. C. C. Dauer.—p. 622.
Incidence of Cancer in Cook County, Illinois, 1937. H. F. Dorn.—p. 628.
Disabling Morbidity Among Industrial Workers, Final Quarter of 1939 and the Entire Year. W. M. Gafafer.—p. 650.

Equine Encephalomyelitis in the United States.—The incidence, mortality and distribution of equine encephalomyelitis in the United States reported for 1939 (8,008 cases) was only about 4 per cent of the number of cases (184,662) reported in 1938. There were 2,471 deaths from the disease. These figures give a case rate of 1.1 per thousand animals (horses and mules) in the affected counties and a case fatality of 30 per cent. The case fatality rate for the eastern type of virus was apparently more than three times as high as that for the western type. In twenty-four states in which only the western type was proved or suspected the case fatality was 26.7 per cent, as compared with 89 per cent in nine states in which only the eastern type was proved or suspected. More than 90 per cent of the cases were reported to have occurred during the summer or early fall. This seasonal prevalence tends to support the pre-

vailing conception regarding the principal natural means of transmission, by blood sucking insects, especially mosquitoes. The reported incidence of encephalomyelitis in vaccinated and unvaccinated horses and mules was 0.37 and 1.2 respectively per thousand animals. No less than 3,000,000 horses and mules (about one fifth of the total in the United States) received specific prophylactic treatment. Vaccination and the retarding of insect breeding appear as the major factors in the control of the disease in animals and its transmission to man.

Rhode Island Medical Journal, Providence

23:47-60 (April) 1940

*Bacterial Endocarditis and Syphilitic Heart Disease. C. H. Boyd, Baltimore.—p. 47.
Medical Management of Gastric and Duodenal Ulcer. S. Morein, Providence.—p. 52.

Bacterial Endocarditis and Syphilitic Heart Disease.—Boyd believes that bacterial endocarditis superimposed on syphilitic valvulitis occurs more frequently than the literature would indicate. Eleven cases are reported in the literature in which it is possible to conclude that a preexisting syphilitic lesion of the aortic valves formed the base on which a secondary infection might have become implanted, and two in which a syphilitic aortitis was present on which vegetations had developed but which showed no valvulitis. These reports appeared within the last twenty years, and about one half in the last five, suggesting an increasing interest in the subject and the possibility that the two processes occur more frequently than has been thought. The necropsy protocols of 8,100 cases at the Baltimore City Hospitals contained 105 instances of bacterial endocarditis. Fourteen were felt definitely to be satisfactory examples of vegetative bacterial endocarditis superimposed on old syphilitic aortic valve disease. Because of lack of material for microscopic study, eight cases were discarded. In the six there was a history of syphilis, positive serologic tests or a history of antisyphilitic treatment. There was gross and microscopic evidence of syphilis of the aortic valve cusps and aorta with absence of valvular changes suggesting other pathologic processes, the vegetations were located and bacteria were demonstrated. Cases of terminal bacterial endocarditis were excluded. Of the six proved cases, all were in Negroes from 30 to 44 years of age. The onset of symptoms was considered acute in only one instance. The duration of symptoms attributable to the bacterial infection before admission varied between seven days and eight months, the period of hospitalization before death between two days and two months and the entire course of illness being nineteen days and two, three, two, seven and eight months respectively. Temperature elevations of only two were significant. Chills were not a feature in any case. Five of the six patients showed rather marked cardiac enlargement, four presented an aortic diastolic murmur, while in one a murmur developed in the course of the illness. Splenic enlargement was noticed in only one case. Petechiae were not seen clinically in any instance, nor were there any embolic phenomena which could be attributed to the breaking off of vegetations. In none of the six cases was it suspected clinically that bacterial endocarditis had existed. This may have been responsible in some instances for failure to observe some of the more classic clinical signs of the disease: petechiae, splenic tumor and hematuria. Five of the patients were admitted with cardiac failure and the sixth with lobar pneumonia. These features apparently overshadowed the bacterial endocarditis. Clinical diagnosis of the association of bacterial endocarditis with syphilitic valvular disease is at best difficult, but it should be suspected in any case of supposed syphilitic aortic insufficiency with a continuous febrile and progressively downhill course, especially if any of the classic signs are present.

Rocky Mountain Medical Journal, Denver

37:241-312 (April) 1940

Surgical Jaundice. E. L. Eliason, Philadelphia.—p. 258.
The Doctor's Stake in Group Hospitalization. W. S. McNary, Denver.—p. 265.
Comparative Study of Tuberculin Patch Test. D. J. Barber, Greeley, Colo.—p. 269.
Therapy of Parkinsonian Syndrome. P. A. Draper, Colorado Springs.—p. 272.

South Carolina Medical Assn. Journal, Greenville

36:97-134 (April) 1940

Mesenteric Thrombosis. M. L. Mathias, Columbia.—p. 97.
Congenital Urologic Difficulties in Children. K. H. Smith, Greenville.—p. 99.
Diagnosis and Treatment of Acute Failure of Circulation. C. Eggleston, New York.—p. 102.

Surgery, Gynecology and Obstetrics, Chicago

70:731-858 (April) 1940

Blood Pressure and Pulse Rate Changes During Thyroidectomy. Robbie Brunner and L. Seed, Chicago.—p. 731.
Anesthesia and Anoxemia in Relation to Use of Nitrous Oxide. F. J. Murphy, Detroit.—p. 741.
Disturbances in Circulation and Respiration in Obstruction of Blood Flow To and From Heart. W. E. Adams and L. Escudero, Chicago.—p. 744.
Effect of Prolonged Local Anesthesia in Oil on Abdominal Wound Healing. C. A. V. Burt, New York, and J. A. Glus, Portland, Ore.—p. 753.
*Thyroid Disease in the Southern Negro: Comparative Analysis of 470 White and 482 Negro Cases from Charity Hospital of Louisiana at New Orleans. F. F. Boyce, New Orleans.—p. 761.
Effects of Eupaverine on Pulmonary Circulation. H. H. Bradshaw and R. J. Chodoff, Philadelphia.—p. 768.
Concepts of New Classification of Ovarian Tumors. W. Schiller, Chicago.—p. 773.
*Treatment of Spontaneous, Threatened or Habitual Abortion. C. G. Collins, J. C. Weed and J. H. Collins, New Orleans.—p. 783.
Effect of Nitrous Oxide-Oxygen-Ether Anesthesia on Oxygenation of Maternal and Fetal Blood at Delivery. C. A. Smith, Boston.—p. 787.
*Etiology and Treatment of Ulcers of Leg. L. M. Zimmerman and A. Faller Jr., Chicago.—p. 792.
Production of Experimental Acute Appendicitis (with Rupture) in Higher Apes by Luminal Obstruction. O. H. Wangensteen and C. Dennis, Minneapolis.—p. 799.

Thyroid Disease in the Southern Negro.—According to Boyce, 952 patients with thyroid disease were treated at Charity Hospital in the course of the twelve and one half years ended July 1938. The white incidence (470 cases) was 1:691 in 324,969 admissions and the Negro (482 cases) 1:503 in 242,245 admissions. A consideration of the figures from the standpoint of toxicity disposes of the idea that toxic thyroid disease is rare in the Negro. It follows rather roughly the ratio of Negro and white hospital admissions. The diffuse variety of toxic disease is more frequent than the nodular in the Negro, although in nontoxic disease the reverse is true. Far more striking than the variations in the incidence are the disparities in mortality. The mortality for the whole series of 952 cases was 5.3 per cent; the Negroes furnished almost two thirds of the mortality. The total male mortality of 14.3 per cent, or fifteen of 105 cases, was more than four times the female mortality of 3.5 per cent, or thirty-three of 847 cases. In Negro women the mortality was higher than in white women in both varieties of nontoxic disease. In both varieties of toxic disease it was more than twice as high. In Negro men the death rate far exceeded the death rate of white men in all varieties of the disease and in the toxic variety it rose to shocking figures. These disparities are beyond explanation, as no argument would seem to apply to the Negro male which does not apply to the Negro female as well. In both Negro and white subjects the mortality for diffuse toxic disease is higher than for nodular toxic disease. This circumstance is also difficult to explain, as in nodular toxic disease the hazards of cardiac disease and other visceral damage are added to the inherent hazards of toxic thyroid disease. More than two thirds of all the patients were treated during the last five and one half years of the study and almost three fourths of the Negroes were treated within this period. In recent years the white mortality has shown some improvement, but the Negro mortality has continued very high, which perhaps is further evidence of the inherently more serious character of this disease in the Negro race. The author cites several studies by other workers which support indirectly his contention that toxic thyroid disease in southern Negroes, as is usual in endemic areas, seems to arise on the basis of a previous nontoxic diffuse goiter, whereas in white subjects it arises as a virgin pathologic change. The simple type of goiter, which amounts to little more than an enlargement of the neck, is fairly frequent in young Negro women. Of a number of such patients observed for several years the gland has either not increased in size or has decreased. Therefore it seems that symptomless thyroid enlargements in young Negro women in

this community should be operated on only after a period of observation. This type of goiter gives rise to no symptoms and in most cases no further pathologic change occurs. In the natural cycle the diffuse toxic stage wears itself out and the gland passes over into the nontoxic stage. Whether or not toxic manifestations reappear depends on whether or not the stimuli, known or unknown, which were responsible for the original activity again become effective. This cycle of events accounts for the fact that nontoxic nodular goiter formed 34 per cent of all the Negro cases against 25.5 per cent of the white cases. It is possible that in some instances the gland may return to the original colloid or resting state. This surmise is supported by the fact that there were forty-five cases of diffuse nontoxic goiter in Negroes more than 40 years of age against twenty-two cases in white persons. Part of the Negro mortality is undoubtedly to be attributed to the inadequate and overcrowded hospital facilities and part of it can be explained by the racial tendency to delay medical consultation. Adequate exposure of the glands is often difficult in Negroes owing to the fact that because of physical labor their neck muscles are highly developed. A study of the causes of death in the two groups of patients furnish proof of the serious character of both nontoxic and toxic thyroid disease in the Negro. The hippuric acid test of hepatic function performed on 130 patients, eighty-five of whom were Negroes, shows that in all varieties of thyroid disease hepatic function is lower in the Negro than in the white patient. Whatever the reason for a decreased hepatic function it probably explains part of the high Negro mortality. However, proper preparation will in most cases overcome the visceral damage. No data to explain the etiology of goiter in the Negro are to be had.

Spontaneous, Threatened or Habitual Abortion.—Collins and his associates used wheat germ oil in the treatment of thirty-six cases of spontaneous, threatened or habitual abortion in combination with progesterone and/or thyroid. The daily maintenance dose ranged from 1 to 1½ drachms (4 to 6 Gm.) unless the patient showed signs of threatened abortion, when from 8 to 12 drachms (32 to 48 Gm.) was given during the first twenty-four hours and then they were placed on the daily maintenance dose. Oil was given until patients reached from eight to eight and one half calendar months of pregnancy. Anterior pituitary-like gonadotropic substance in the form of antuitrin S was administered intramuscularly in 1 cc. doses given at weekly intervals until the patient was pregnant from four to four and one half calendar months. In a few cases injections were continued until the seventh calendar month. One rabbit unit of progesterone was administered daily intramuscularly when cramping or bleeding was actually present and, when the symptoms ceased, antuitrin S was substituted. Thyroid extract in from one tenth to one half grain (0.0065 to 0.03 Gm.) doses twice daily was given to all patients showing evidence of hypothyroidism: obesity, irregular menstrual periods, slow pulse and the like. Cases were classified as "threatened abortion" if cramping pain in the lower part of the abdomen persisted longer than twenty-four hours or if a patient had bleeding and as "habitual abortion" if the patient had had two or more spontaneous abortions or had had one previous abortion immediately prior to or attempted to abort during her present pregnancy. Of twenty-four patients with threatened abortion treated three went to completion despite therapy. Of the remainder, fourteen have been delivered of normal, full term children, one has now passed the period of viability, and the remainder have retained their pregnancies without further signs or symptoms of abortion. This represents a successful arresting of the abortion in 87 per cent of these cases. Of twelve habitual aborters eight have been delivered of normal, full term, healthy infants, while another is now pregnant six and one half calendar months. Three patients aborted despite treatment. In one of these the abortion was precipitated by an attack of malaria. These twelve women, prior to treatment, had a total of twenty-one pregnancies resulting in only three live births.

Etiology and Treatment of Ulcers of Leg.—Zimmerman and Faller assert that the majority of leg ulcers are associated with diseases of the veins. Whether due to varicose veins or to deep thrombophlebitis, they are essentially infectious in origin and develop on the basis of periphlebitic infiltraton and cicatrization. They are similar in pathogenesis and clinical manifestations and respond to similar forms of therapy. The essential predisposing pathologic change is ischemia from inflammatory sclerosis of the skin and subcutaneous tissues. External secondary infection adds to the fibrosis and circulatory insufficiency. The tissue changes are permanent and irreversible and the ulcers may persist or continue to evolve even after the associated varicosities are completely eradicated. From the various therapies for crural ulcers, one fact survives; gentle, mechanical pressure. Mechanical measures have been the mainstay of the authors' therapy for ulcers and eczemas of venous origin and are relied on almost to the exclusion of all other forms of treatment. They have come to believe that ulcers of the leg do not, as a rule, constitute a difficult problem. Treatment is almost invariably ambulant; bed rest and elevation are rarely found necessary. The patients are permitted to go about their usual affairs without restriction as long as the pressure bandages are in place. Frequently healing of ulcers by ambulant treatment has been accomplished when prolonged bed rest had failed. Recumbent management is limited to the small group of patients who do not tolerate occlusive dressings and to those with acute infection severe enough to demand bed rest. For obtaining gentle elastic pressure, Unna's paste boot is relied on not only for the treatment of ulcers but also for other complications of varicose veins, including local phlebitis, phlebitic indurations and varicose eczemas. Occasionally if in long standing callous ulcers, after the usual initial rapid improvement, the tempo slows down, renewed stimulus may be obtained by strapping the ulcer with strips of adhesive tape and by applying the boot over the strapping. If this stimulus also wears off before the ulcer is healed, further acceleration may be secured by applying pads of rubber sponge under the boot. At first the boots are changed once a week. Later when edema has subsided and the amount of exudate has diminished they may be left on for two or three weeks or longer. Patients are instructed to return with boots on. They are removed in the clinic, the limbs are cleansed and the new boot is applied. When healing is complete, further protection with Unna's paste or elastic bandages for several weeks longer is advised until the scar is sufficiently firm and tough. Post-thrombophlebitic limbs with persisting edema may require permanent supportive bandaging to prevent swelling and a tendency to further ulceration. Concomitant varicosities should be eradicated and associated local and general conditions attended to.

Tennessee State Medical Assn. Journal, Nashville

33:119-158 (April) 1940

Restoration of Function After Injury, with Special Reference to Extremities. D. Eve, Nashville.—p. 119.
Operative Correction of Lower Extremity Length Inequality. C. H. Crego Jr., St. Louis.—p. 124.
Management of Fractures About Elbow. T. Bagwell, Knoxville.—p. 130.
Rationale of Splenectomy in Treatment of Certain Anemias. G. M. Curtis, Columbus, Ohio.—p. 137.
Acquired Syphilis in Childhood: Report of Field Study. C. B. Tucker, Nashville.—p. 143.

West Virginia Medical Journal, Charleston

36:145-192 (April) 1940

Carcinoma of Breast. E. P. Buchanan, Pittsburgh.—p. 145.
Treatment of Coronary Occlusion. W. C. Swann, Huntington.—p. 153.
Surgical Treatment of Peptic Ulcer. C. Williams, Richmond, Va.—p. 157.
Peptic Ulcer. M. A. Blankenhorn, Cincinnati.—p. 162.
Physical Defects of School Children in Certain Areas of Logan County. B. D. Smith, Omar.—p. 165.
Hemorrhagic Purpura Due to Sulfapyridine: Report of Case. C. A. Hoffman, Huntington.—p. 169.
Preoperative and Postoperative Treatment from the Anesthetist's Point of View. E. B. Tucker, Morgantown.—p. 171.
Regional Ileitis. R. P. Hawkins Jr., Clifton Forge, Va.—p. 177.
Prenatal Diet and Sound Teeth. W. R. Batson, Pine Grove.—p. 179.

Wisconsin Medical Journal, Madison

39:253-336 (April) 1940

Mental Medicine Today. C. F. Read, Elgin, Ill.—p. 267.
Sulfapyridine (Dagenan) in Treatment of Pneumonia: Preliminary Report of Its Use in Ninety Cases. F. D. Murphy, R. A. Nims and J. K. Karr, Milwaukee.—p. 272.
Amblyopia. W. A. Ford, Sheboygan.—p. 278.
Surgically Difficult Growths of Female Pelvic Viscera. A. H. Curtis, Chicago.—p. 281.
Office Treatment of Gynecologic Conditions. H. H. Cummings, Ann Arbor, Mich.—p. 284.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:517-558 (March 30) 1940

*New Method of Preventing Adhesions: Use of Amnioplastin After Craniotomy. Y.-C. Chao, S. Humphreys and W. Penfield.—p. 517.
Localized Emphysema as Sign of Incomplete Bronchial Obstruction. J. Maxwell.—p. 520.
*Cerebral Hemorrhage from Rupture of Congenital Intracerebral Aneurysm in Child. Kate Hermann and Agnes R. Macgregor.—p. 523.
Death from Quinine Poisoning. C. K. Vartan and G. Discombe.—p. 525.
Cyst of Jacobson's Organ. W. Brandt and H. T. Roper-Hall.—p. 527.

Prevention of Adhesions.—For the preparation of amnioplastin, amniotic membranes received from the delivery room are washed in water to remove as much of the blood and mucus as possible. The inner membrane (the amnion) is freed from the outer membrane (the chorion) by finger dissection. The membrane is again washed in water and placed in 70 per cent alcohol. The thin membrane is stretched, dried in sheets of convenient size and preserved dry or in 70 per cent alcohol until such time as final sterilization can be carried out. Sterilization is accomplished by autoclaving or boiling the sheets in distilled water. A thin, pliable, transparent membrane is produced in which there is no cellular structure. Amnioplastin is placed in Ringer's or physiologic solution of sodium chloride for twenty minutes and then flattened out between glass plates. Chao and his associates examined cats at intervals varying from ten to sixty days after the surface of the lacerated brain had been covered with this membrane. At necropsy it was found that a new dura had formed. In no instance was there evidence of gross adhesion. The amnioplastin sheet disappeared progressively. At thirty days no gross or microscopic evidence of membrane could be found. Remains of the amnioplastin could be seen as an amorphous substance without cellular structure. There was evidence of beginning regeneration of the dura and pia. By twenty days the dural defect had completely filled in, the pia had partially closed over the destroyed brain, and the membrane between the two was represented by a thin amorphous material. The authors recommend amnioplastin for clinical use when a craniotomy is carried out and the brain is exposed for a considerable time or when the brain is injured as by the removal of a tumor. The amnioplastin is to be interposed between dura and brain, both when the brain is intact and when it is lacerated. The authors used it for this purpose and believe that local postoperative edema is thus lessened. There was no increase in immediate cellular reaction in the spinal fluid. It has not been used long enough to determine its effect on the incidence of postoperative epilepsy. Wounds of the brain should be treated according to the best established principles, and amnioplastin should be spread over the wounded surface to prevent meningocerebral adhesion. If there is a defect in the dura as well as in the pia, amnioplastin will provide for the reformation of dura and pia as separate layers. The membrane permits regrowth of leptomeninges over the brain even after cerebral laceration. It provides for the restoration of the subdural space. It should serve in other military and civil surgical fields to prevent adhesions in the peritoneal and joint cavities and about tendons and sutured nerves.

Hemorrhage from Rupture of Intracerebral Aneurysm.—Hermann and Macgregor cite an instance of a congenital intracerebral aneurysm in a boy 4½ years old. He had been in excellent health until symptoms of cerebral hemorrhage occurred. Shortly after admission to the hospital, breathing ceased; the pulse remained of good quality. A tracheal tube was inserted and artificial respiration was maintained. Exploratory cranial perforations were made in each parietal region but no collection of blood was found. A cannula on each side was directed through the brain toward the lateral ventricle. When the ventricular cavity was entered, fluid blood with fragments of clot and disorganized cerebral tissue escaped from each cannula. From this it was surmised that a massive intracerebral hemorrhage had occurred and had ruptured into one of the ventricular cavities probably producing severe damage to the brain substance. No further active treatment was attempted. The child died fifteen hours after the onset of symptoms. Postmortem examination revealed that the hemorrhage from the aneurysm had occurred much earlier than that of the fatal rupture. It was supposed that there was only a limited leakage of blood at this time, as no clinical history suggestive of an earlier "cerebral catastrophe" could be elicited. It was probable that at least a part of the fibrous thickening which affected the major portion of the sac wall was the result of this earlier blood clot. These events were probably of long standing, as the fibrous tissue of the sac wall was mature and relatively acellular. Two congenital defects of the muscular coats were found in relation to the junction of branches of the anterior perforating group of arteries with the left middle cerebral artery. The defects were at the acute angle of the junction in each case. There was a gap in the muscular coat, which was filled by fibrous tissue continuous with that of the adventitia. The internal elastic lamina was intact and the tunica intima was unaltered. Except for these microscopic defects at the branch junction lines the structure of the cerebral arteries was normal.

Edinburgh Medical Journal

67:225-296 (April) 1940

Surgery of Blood Vessels. J. R. Learmonth.—p. 225.
Fate in Body of Sulfapyridine. A. J. Clark.—p. 241.
Levulose Tolerance Test in Childhood. J. C. Thompson and A. W. Wilkinson.—p. 250.
A Pioneer in Tropical Medicine. E. D. W. Greig.—p. 262.
Early Stages of Leukemia. J. C. Caird.—p. 264.

Journal of Pathology and Bacteriology, Edinburgh

50:201-392 (March) 1940

Sex Hormones and Foá-Kurloff Cell. J. C. G. Ledingham.—p. 201.
Fibrosis of Liver in Heart Failure. T. D. Day and T. G. Armstrong.—p. 221.
Occurrence of Virus III in Rabbits in Lesions of Infectious Fibroma and of Transplantable Sarcoma. C. H. Andrewes.—p. 227.
Bacterial Spores as Antigens. J. W. Howie and J. Cruickshank.—p. 235.
Infection of White Mice with Three Types of Corynebacterium Diphtheriae. K. Zinnemann.—p. 243.
Blood Changes and Postmortem Findings Following Intravenous Inoculation of Sheep with Culture Filtrates of Clostridium Welchii, Types A, C and D. W. S. Gordon, J. Stewart, H. H. Holman and A. W. Taylor.—p. 251.
Survey of Types of Clostridium Welchii Present in Soil and in Intestinal Contents of Animals and Man. A. W. Taylor and W. S. Gordon.—p. 271.
Observations on Living Vaccinia Virus in Corneal Cells of Rabbit. K. B. Eisenberg-Merling.—p. 279.
Bacteriologic Examination of Water Supplies. Clara Raven, D. Peden and H. D. Wright.—p. 287.
Pathologic Changes in Sex Organs After Prolonged Administration of Sex Hormones to Female Rats. V. Korenchevsky and K. Hall.—p. 295.
Haemophilus Influenzae and Influenza Virus in Relation to Bronchitis. J. Mulder, with technical assistance of R. van Kolken.—p. 317.
Observations on Polyarthritis and Experimental Erysipelothrix Infection of Swine. D. H. Collins and W. Goldie.—p. 323.
Studies on Erysipelothrix Rhusiopathiae. P. S. Watts.—p. 355.

Lancet, London

1:629-676 (April 6) 1940

*Estrogenic Properties of Stilbestrol Dipropionate and Hexestrol. P. M. F. Bishop, R. K. Bowes, M. Boycott, R. Kellar, T. N. Macgregor and B. C. Murless.—p. 629.
Pneumococcic Parotitis and Antecedent Auriculotemporal Syndrome. R. T. Payne.—p. 634.
*Blood Urea and Urea Clearance Before and After Administration of Urea by Mouth. F. Morton and A. M. Nussey.—p. 636.
Acute Mercurial Poisoning After Cystoscopy: Report of Three Cases. B. H. Page and C. Wilson.—p. 640.
Extracranial Ligature of Middle Meningeal Artery. M. Wassermann.—p. 643.
Treatment of Gas Gangrene. E. da C. Afonso.—p. 644.

Estrogenic Properties of Stilbestrol Dipropionate and Hexestrol.—Bishop and his associates treated sixty-six cases in which there were menopausal symptoms and found that eight did not react to stilbestrol dipropionate, to hexestrol or to both. Of thirty-six cases of atrophic vaginitis, one case did not respond either to the dipropionate or to hexestrol. Thus, in 102 cases presenting subjective and/or objective menopausal manifestations relief was obtained in ninety-three (91.2 per cent). Of the sixty cases treated with stilbestrol dipropionate six (10 per cent) did not respond. Of the sixty-three cases treated with hexestrol seventeen (27 per cent) did not respond. The higher percentage of failure with hexestrol was probably due

to the relatively lower dosage. In forty-eight cases of amenorrhea, menstruation was induced in twenty-eight by stilbestrol dipropionate or by hexestrol or by both. Of thirty-one cases treated with stilbestrol dipropionate nine did not respond; nor did twenty out of the twenty-seven cases treated with hexestrol. These rather poor results are undoubtedly due to low dosage. The two substances gave poor results in a small group of cases of dysmenorrhea and uniformly successful results in inhibiting lactation. Toxic by-effects were noted in twenty-three of 155 cases of the present series. They were usually transient and mild, such as nausea and occasionally vomiting and constipation. The authors conclude that stilbestrol dipropionate and hexestrol have estrogenic properties similar to those of stilbestrol. Toxic effects, though not severe, developed in 21.6 per cent of the cases treated with stilbestrol dipropionate and in 4.5 per cent of the cases treated with hexestrol.

Blood Urea and Urea Clearance.—Morton and Nussey investigated the effect of large doses of urea on the clearing capacity of the kidneys. Their results confirmed previous observations that the Van Slyke technic often yields in normal subjects clearance values well below the accepted standards. Nineteen of fifty normal subjects failed to qualify as normal. Normal values for urea clearance were obtained after the administration of a 15 Gm. dose of urea by mouth. In parallel experiments on patients with evidence of renal disease the ingestion of urea did not improve the clearance figures, and a fall was often recorded in such cases. The authors saw no harm resulting from giving this heavy dose of urea to patients with an already high level of blood urea, though they think that this procedure would not commend itself as a routine in cases of uremia or in the acute phase of nephritis. Frequent collections of specimens of urine and of blood after the ingestion of urea made it possible to follow its effect on the functional capacity of the kidneys. Calculation of the urea clearance over any period of time must be based on the knowledge that the blood urea remains reasonably constant throughout. The degree of constancy of this factor after the administration of urea by mouth depends largely on the rate of absorption of urea from the bowel and of its disposal from the blood stream by the kidney. A study of blood urea curves, based on half-hourly observations, demonstrates that a relatively stable period exists between three-quarters and one and three-quarters hours after the administration of urea by mouth. The blood urea observed at one and one-quarter hours approximates closely the mean calculated from the three-quarters hour and one and three-quarters hour values. The authors criticize the procedure which Fowweather proposed for the Van Slyke clearance formulas to specimens obtained after the administration of urea by mouth and recommend the following modification: The patient is allowed to have his usual meal the night before. On the morning of the test a breakfast of bread, butter and a piece of fruit, with one small cup of tea, is permitted. Two hours later the patient empties the bladder and immediately afterward 15 Gm. of urea in 200 cc. of water is given. The bladder is again emptied after forty-five minutes and the exact time recorded. This is repeated an hour later. Midway between the two a specimen of blood is obtained. The urea clearance is calculated from the data obtained from analysis of the third specimen of urine.

Practitioner, London

144:309-452 (April) 1940

Diagnostic Significance of Knee Jerk. H. Cohen.—p. 309.
Neuralgia. W. Harris.—p. 320.
Aspect of Insomnia. T. A. Ross.—p. 329.
Diagnosis and Treatment of Spinal Cord Injuries. D. McAlpine.—p. 337.
Epilepsy. W. R. Russell.—p. 347.
Diagnosis and Treatment of Syphilis of Nervous System. F. R. Ferguson.—p. 354.
Meningitis. W. G. Wyllie.—p. 369.
Diagnosis and Treatment of Intracranial Tumors. W. McKissock and J. W. D. Bull.—p. 379.
Recent Advances in Study of Polyneuritis and Its Treatment. S. Behrman.—p. 388.
Pink Disease (Erythredema Polyneuritis, Infantile Acrodynia). D. Paterson.—p. 404.
Air Sickness. T. S. Rippon.—p. 411.
The Emergency Legislation. D. H. Kitchin.—p. 421.
Modern Therapeutics: X. Expectorants and Linctuses. R. A. Young.—p. 433.

Journal de Chirurgie, Paris

55:193-288 (March) 1940

Calluses: Etiology and Biologic Aspects. R. Leriche and A. Jung.—p. 193.
*Traumatic Diabetes Insipidus. J. Brêhant.—p. 205.

Traumatic Diabetes Insipidus.—Brêhant reports a case of traumatic diabetes insipidus which he observed daily for four months after the occurrence of the trauma. A woman aged 41 was hurt in an automobile accident. Examination revealed fracture of the nasal bones and a painful spot at the level of the left temporomaxillary articulation. The next day left oculopalpebral ecchymosis, polydipsia, polyuria, loss of smell and decrease in vision were observed. X-ray examination disclosed a radiating frontal fracture at the roof of the orbit, fracture of the left temporal bone, and opacity of the left frontal sinus and right sphenoid sinus suggesting a hematoma. Diabetes insipidus in this case was caused either by a hemorrhage occurring within the tuber or by pressure of a hematoma at the level of the floor of the third ventricle. The patient was treated with estrogenic substance, lumbar puncture, a salt-free diet, subcutaneous injections of solution of posterior pituitary and posterior pituitary administered in a powdered form into the nose. The latter two and particularly the last method were effective. Diuresis decreased considerably while treatment was being administered. Diabetes insipidus as a complication is observed as a rule after frontal and temporal trauma. It may be caused by direct traumatic lesion of the diabetogenic centers, by foreign body, by compression caused by a hematoma, by intracranial hypertension, by involvement in a fracture callus, by hypertrophic pachymeningitis, by fracture osteitis of the sphenoid or by posttraumatic gliomatous neoplasms. Polyuria and polydipsia are the main symptoms. There may appear other morbid manifestations pointing to complex changes in the infundibulum and the hypophysis. In addition to the center of water metabolism, that of fat, as well as sexual and hypnic functions, may likewise be involved. The seat of these lesions has not been definitely located. Some believe it to be in the hypophysis, others in the infundibulotuber. The prognosis in traumatic diabetes insipidus is encouraging but requires constant care. The treatment consists chiefly of hypophysial therapy administered hypodermically or still better of a powdered hypophysial substance administered intranasally. The latter form of treatment produced the best results. Early surgical attention at the time of traumatism may favorably influence the course of the disease in some instances.

Schweizerische medizinische Wochenschrift, Basel

70:269-292 (March 30) 1940. Partial Index

Survey Over Modern Glaucoma Operation with Special Consideration of Cyclodiathermic Puncture. H. Richner.—p. 269.
Diagnosis and Therapy of Adrenal Insufficiency. F. González Alvárez, O. Orias and J. B. Sosa Gallardo.—p. 271.
Demonstration of Numerous Microfilariae in Both Eyes by Means of Slit Lamp Microscope. B. Semadeni.—p. 275.
Surgical Correction of Foot Deformity Produced by Defect of Fibula. K. Lenggenhager.—p. 276.
*Stilbene Preparations with Estrogenic Action in Endocrine Therapy. R. Wenner.—p. 277.
*Treatment of Epidemic Meningitis with Sulfapyridine. W. Jäckli.—p. 280.
Azosulfamide in Treatment of Bacillary Dysentery. V. Gorlitzer.—p. 281.

Stilbestrol in Endocrine Therapy.—Wenner administered stilbene preparations orally to nine women who had undergone roentgen castration for menopausal hemorrhages some two years previously. Two 5 mg. tablets were given every three or four days until a total of 60 mg. had been reached. This dose produced a glandular hyperplasia, while from 25 to 30 mg. was sufficient to produce thickening of the quiescent endometrium. The subsequent administration of progesterone resulted in true menstruation and an enlargement of the uterus. Hot flushes, vertigo, headaches and pruritus vulvae were noticeably improved. Stilbestrol was administered to fourteen women to prevent lactation and to thirty-seven to inhibit it. Two 5 mg. tablets given during the first twenty-four hours after delivery prevented lactation in all but three. The author suggests that in at least one of these cases the drug might have been given

too late. He suggests that 2 or 3 mg. of stilbestrol be given by injection during the first hours after delivery and the effect of this injection be supported by oral medication for the next two days. The required dosage fluctuates individually. The arrest of an existing lactation is more difficult than is its prevention before onset. Two 5 mg. tablets given on five successive days usually arrest the lactation. Secondary effects necessitating interruption of medication were comparatively rare in a series of eighty cases. Nausea developed in two and vomiting and vertigo in one.

Sulfapyridine in Epidemic Meningitis. — Treatment of epidemic meningitis at the children's hospital in Zurich consists, according to Jäckli, in oral administration of sulfapyridine in a daily dose of 1 Gm. for each 10 Kg. of body weight. This quantity is distributed evenly over the twenty-four hours at four hour intervals. The medication is continued until the cerebrospinal fluid is clear (from 50 to 150 cells per cubic millimeter) and meningococci are no longer demonstrable, which is usually the case in from two to five days. The dose is gradually decreased and the medication is terminated between the eighth and the twelfth day. The individual doses at the onset are somewhat larger in order to reach the desired concentration in the blood and cerebrospinal fluid as soon as possible. Lumbar punctures are made twice daily in the beginning, control punctures occasionally. The treatment is often begun with a blood transfusion. Serum is not given. Cardiac and circulatory stimulants are employed according to need. Intramuscular injections of sulfapyridine are employed when oral medication is not tolerated. Sulfapyridine by intravenous drip is another valuable mode of administration. It makes possible the administration at the same time of nutrient substances and fluids. It is reserved for comatose patients and for patients with primary uncontrollable vomiting. The daily dose of soluble sulfapyridine is added to the infusion fluid of a 5.5 per cent solution of dextrose in Ringer's solution. Cardiac and circulatory stimulants may be added to the infusion fluid. The drip infusion is continued only as long as absolutely necessary, usually from two to five days. The author employed this therapy for sixteen children with epidemic meningitis admitted during the epidemic of December 1939 to February 1940. The ages of the children varied between 6 months and 15 years. They were either completely cured or had advanced far in their convalescence at the time of the report.

Archivio Italiano di Chirurgia, Bologna

58:1-94 (Jan.) 1940

*Infiltrations of Procaine Hydrochloride in Treatment of Circumscribed Acute Inflammation. M. Montanari Reggiani.—p. 1.
Behavior of Crasis of Blood in Hemoperitoneum. A. Puzzan and G. Baccaglini.—p. 56.
Horseshoe Kidney Complicated by Tumor and by Calculosis. G. Placitelli. —p. 79.

Procaine Hydrochloride in Acute Inflammations. — Montanari Reggiani reports the effect of local infiltration with procaine hydrochloride in acute circumscribed inflammatory processes in twenty-six cases. From 2 to 4 cc. of a 1 per cent solution of procaine hydrochloride was injected in cases of circumscribed inflammation and from 20 to 40 cc. in more extensive acute inflammation. The infiltrations were carried out as for regional anesthesia, the solution being injected slowly into the inflamed tissues daily for the first two or three infiltrations and every other day for the last two. The total number of infiltrations varied from two to five. The first injection relieved the pain within the first hour and brought on an immediate reaction of transient aggravation of the symptoms, except that of pain. The reaction lasted from twelve to twenty-four hours and was followed by rapid regression of inflammation and infiltration and by limitation of the local process. Subsequent infiltrations were effective in controlling pain and in accelerating the regression of inflammation and suppuration. Clinical recovery was obtained in from three to six days. The clinical improvement was paralleled by alterations in the leukocyte count of the peripheral and the focal blood and the conversion of the acid reaction of the pus to an alkaline one. The neutrophilic leukocytosis, diminution in the monocytes and lymphocytes and the absence of the eosinophils, and the leukopenia of the focal blood were changed to a normal blood picture after the treatment. The author concludes that infiltrations of procaine hydrochloride bring about a stimulation of local and general immunity by which inflammation and suppuration are controlled.

Deutsches Archiv für klinische Medizin, Berlin

188:481-656 (Feb. 14) 1940. **Partial Index**

Blood Reserves in Man. F. Grosse-Brockhoff and W. Molineus.—p. 481.
Venous Blood Flow. F. Grosse-Brockhaff.—p. 511.
*Acute Thrombopenic Purpura with Granulocytopenic Reactions. H. Oettel and S. Thaddea.—p. 537.
*Chronic Leukemia and Polycythemia. W. Tischendorf and K. Herzog. —p. 566.

Hemorrhagic Purpura with Granulocytopenic Reactions.—Oettel and Thaddea describe an unusual case of acute essential thrombopenia with granulocytopenia in which blood transfusions and a combined vitamin C and liver extract therapy effected a prompt recovery. The patient was a man aged 38 whose familial and personal history was good. A septic angina with high fever induced a painful gingivitis. After several weeks small red spots appeared over the entire body, increasing in intensity. Military exertions aggravated the condition. Pains set in extending from the abdomen to the small of the back. Blood appeared in the urine and in the expectorations. At this stage he was hospitalized. The general tendency to cutaneous bleeding was found to be especially localized in the joint flexures. Three small painful necrotic areas were observed on one side of the mouth near the upper molars. Laboratory tests disclosed a leukopenia (2,400) with lymphocytosis (85 per cent), neutrophilia (5 per cent) and eosinophilia (5 per cent). The erythrocytes were approximately normal; thrombocytes were greatly diminished (43,000); bleeding and clotting times were greatly prolonged (thirty-two minutes and thirteen minutes, respectively). Sternal puncture showed myelocytic and metamyelocytic bone marrow conditions but no damage to the megakaryocytes. Hematuria was massive with a 9 per thousand albumin in the erythrocytic filtrate, which on spectroscopy was seen to contain no hemoglobin. The patient was given three blood transfusions of 500 cc. at intervals of three days, daily intramuscular injections of 2 cc. of liver extract and intravenous injections of 0.5 Gm. of ascorbic acid. According to the authors a hemorrhagic diathesis of the skin and mucous membrane in conjunction with septic angina justifies the diagnosis of acute hemorrhagic purpura. The general capillary system is affected. In addition the blood and bone marrow tests show a steady reduction in thrombocytes and neutrophils and an increase in lymphocytes. High fever and painful necroses in the oral regions attend the granulocytopenic manifestations, which may be so aggravated by undue physical strain as to become outright granulocytopenia. Allergy to foods or medicaments is not an etiologic factor.

Chronic Leukemia and Polycythemia. — In connection with their study of sixteen cases of myeloblastic leukemia and of the literature, Tischendorf and Herzog discuss the diagnostic difficulties (clinical, hematologic and anatomic) inherent in the disease pictures. Acute myelosis may appear simply as a hypertrophic tonsillitis and remain unrecognized until a dental intervention activates the oral infections, resulting in high fever, anemia, enlargement of the spleen and leukocytosis. The symptomatology of the subacute form is deceptive because its manifestations are variable. Acute and subacute myeloblastic leukemia may be biologic variations of chronic leukemia. Neither the leukocytic picture nor sternal puncture furnishes an unequivocal distinction between the two types. However, the subacute form is characterized by generalized edema of the lymph nodes, whereas the acute type is localized. The authors think that acute and subacute myeloblastic leukemia may rightly be regarded as of neoplastic nature. They are in agreement with other investigators that acute myelosis represents a condition of metastasizing neoplasia that needs to be studied from this point of view. Edematous processes must be interpreted as expressing the form which the varying

degrees of blood cell maturation may assume. Like leukemias, erythremias need to be regarded as tumor growths. Polycythemias not infrequently develop into myeloid leukemias, thus disclosing close interconnection. As fibromas, fibrosarcomas and sarcomas represent different degrees of maturity of the fiber tissue, blood cells may also develop with varying maturation. In myelosis, immature cells may appear abundantly in the blood and extremely immature and pathologic myeloid cells may predominate, as is shown by the malignity and rapid evolution of micromyeloblastic leukemias.

Deutsche Zeitschrift für Chirurgie, Berlin

253:97-324 (Feb. 16) 1940

Intra-Articular Xanthomas. H. Willenegger.—p. 97.
Roentgenologic Results of Treatment of Vertebral Fractures. W. Ehrlich. —p. 125.
Roentgenologic Aspects of Epiphysial Necroses, Also Contribution to Early Diagnosis of Perthes' Disease. J. C. Lehmann.—p. 132.
*Morphology and Clinical Aspects of Thymus. W. Weise.—p. 145.
Bactericidal Effect of Bone Marrow Under Influence of External Influences. F. Bordasch.—p. 237.
*Raynaud's Disease and Scleroderma. P. Sunder-Plassmann and F. Jaeger.—p. 263.
Administration of Organic Calcium Salts in Combination with Vitamin B and D as Well as C in Experimental Fractures of Ribs, Radius and Ulna in Different Breeds of Rabbits. G. Krockert.—p. 293.
Regeneration: Its Application in Reconstructive Surgery. K. Gebhardt. —p. 315.

Morphology and Clinical Aspects of Thymus.—Weise studied the morphology of the thymus in specimens obtained from surgical interventions, from ten cases of sudden death and from eighty-nine necropsies as well as in a number of dogs. These studies suggested that the thymus is a functioning gland throughout the entire life. Weise was able to demonstrate a hitherto unobserved epithelial medullary framework typical of a gland of internal secretion. The epithelial medullary reticulum of the thymus is a secretory, holocrine, tubular gland. The secretion is carried away by the lymph and blood vessels. The smallest morphologic and functional unit of the thymic medulla is a short epithelial tube, a nearly spherical body. Groups of these "primitive bodies" are connected by a common membrane. The tubule performing the holocrine function has a limited life span and new tubules are formed probably continuously throughout life. Aged tubules are transformed into Hassal's corpuscles and as such they no longer perform an endocrine function. The thymic medulla of the dog is a tubular gland only in young animals. In aged animals it is transformed into a storage organ, which retains its basic structure; namely, a parenchyma split by tubuli which are transformed into cysts. These new observations on the structure and physiology of the thymic medulla led to a new evaluation of its function in various pathologic conditions, such as osteitis fibrosa generalisata, lymphatic leukemia, lymphogranulomatosis, hepatic cirrhosis and particularly exophthalmic goiter and myasthenia gravis. In some of these disorders the tubuli seemed to be stimulated to greater activity, whereas in others an inhibitory effect was observed. Examination of the thymus in patients with exophthalmic goiter revealed a histologic picture indicative of a myasthenic component. Observations on the thymus of patients with a severe form of myasthenia pseudoparalytica disclosed morphologic and metabolic characteristics of a hyperfunctioning gland. The interpretation of myasthenia as the result of a benign neoplasm of the thymic medulla suggests the possibility of a cure through surgical intervention. Irradiation is not promising because the thymic medulla seems to be refractory to rays. The author believes that surgical removal should be attempted in severe cases of myasthenia even though the fact that the thymus may extend far on the pericardium may render the excision difficult. Thymectomy in dogs did not cause a loss of function but was followed by hyperplasia of the lymph nodes of the organism.

Raynaud's Disease and Scleroderma.—Sunder-Plassmann and Jaeger describe the clinical and neurohistologic features of two cases of Raynaud's disease associated with scleroderma. The first patient was a woman aged 34 in whom, after all conservative therapeutic methods had failed, the right stellate and the middle cervical ganglions were resected. The disfiguring facial lesions subsided. The lesions of the hands, however, contractions and trophic ulcers, as well as attacks of pain and pallor, persisted. The trophic ulcerations disappeared following a left sided stellectomy. The second patient, a woman of 18, had a right sided stellectomy, which failed to improve the condition. Microscopic examination of the ganglions revealed identical pathologic changes. The authors believe that in Raynaud's disease associated with scleroderma, as in Raynaud's disease alone, there exists a toxic lesion in the substance of the central and peripheral portions of the sympathetic nervous system. This toxic lesion is morphologically demonstrable. It gives rise to a peculiar condition of irritation, to a hyperergic reversion in the sympathetic nervous system, which is followed by attacks of impaired blood supply and by dystrophic changes in the tissues. The authors gained the impression that hormonal changes play an important part in view of the fact that the neurosympathetic and the endocrine systems form a single biologic unit. They stress the significance of the neurohormonal cell system, which may be regarded as a part of the sympathetic preterminal plexus and the peculiar epithelial cells which exist in the ganglions of the sympathetic trunk. Certain factors, the nature of which has still to be explained but in which neurohormonal interactions play a part, are responsible for the fact that in some cases only Raynaud's disease develops while in others it may be associated with scleroderma.

Klinische Wochenschrift, Berlin

19:169-192 (Feb. 24) 1940

Action of Nicotine and Regulation of Smoking. W. Straub and A. Amann.—p. 169.
*Renal Threshold of Blood Sugar Concentration and Its Modification by Vitamin C. R. Stöger.—p. 171.
*Condition and Function of Heart Under Influence of Digitalis. F. Meyer. —p. 174.
Determination of Iron in Cerebrospinal Fluid. J. Vonkennel and T. Tilling.—p. 177.
Observations on Significance of Gonococcus Complement Fixation Reaction for Efficacy of Sulfanilamide Preparations in Gonorrhea of Women. W. Schramm.—p. 182.

Renal Threshold of Blood Sugar and Vitamin C.—By renal threshold Stöger means that concentration of blood sugar which, when exceeded, results in glycosuria. The normal threshold value in persons of about 50 years of age averages 185 mg. per hundred cubic centimeters. The renal threshold for sugar is variable and is influenced by dietetic mistakes, complicating disease, change from ordinary insulin to insulin with retarded action, hormonal changes and psychic influences. The threshold increases with age. In diabetic patients over 50 years of age it is around 200 mg. per hundred cubic centimeters and higher. The threshold increases with the duration of diabetes mellitus, but in the course of dietetic mistakes and complicating diseases it may again decrease. Renal diabetes is characterized by a low renal threshold in the presence of a normal blood sugar value, by lack of dependence of glycosuria on the food intake and by the inefficacy of insulin. The resistance to insulin involves only the glycosuria, not the glycemia. The pathogenic relationship between the renal and true diabetes is indicated by the observation that renal diabetes is frequent in relatives of diabetic patients and that renal diabetes may develop into true diabetes mellitus. The author found that oral administration of ascorbic acid in doses of from 300 to 500 mg. daily for eight days "fixed" the threshold or rapidly increased it after it had been decreased by a tolerance test. He concludes that vitamin C acts as a biocatalyzer. He employed this action of vitamin C for therapeutic purposes in cases of renal diabetes and found that the intermittent administration of vitamin C (five days every month) produced a considerable and permanent reduction of glycosuria. He thinks that this therapy might prevent or at least retard the transformation of renal diabetes into a true diabetes mellitus.

Heart Under Influence of Digitalis.—Studies on the cardiac function of patients with circulatory defects led Meyer to a new conception which he believes to be of value for the understanding of the action of digitalis. He believes that the clinical picture of cardiac insufficiency characterized by air hunger and edema is not alone and primarily the result of reduced systolic pumping action of the heart. This widely accepted opinion is not the only possible one. Studies on the cardiac beat volume of patients with circulatory defects generally disclose a normal cardiac performance. On the basis of the

constancy of the work effort of the heart in the majority of cases with clinical signs of circulatory insufficiency the author develops a new conception of the therapeutic mechanism of the digitalis bodies. According to this conception the action of digitalis is not due to an increase in the cardiac performance but rather to a change in the internal action requirements of the cardiac musculature. This change consists in the pleonectic shifting of the volume-tension curve of the cardiac musculature. The muscle is enabled to perform its work with essentially smaller initial tensions. The diseased heart can work with reduced venous filling pressures under the influence of digitalis. The correlatively increased pressure on the venous side of the circulation decreases and thus the stasis disappears, which up until then had enabled the weakened heart to do normal work. Thus it is not the change in the performance but rather in the condition of the heart which is decisive for the improvement of the circulatory disease.

Strahlentherapie, Berlin

67:1-172 (Jan. 31) 1940. **Partial Index**

*Significance of Finsen Light Treatments in Control of Lupus Vulgaris. S. Lomholt.—p. 3.
Thorium X Rods in Carcinomas of Skin and Hemangiomas. K. Hoede and F. Schaefer.—p. 23.
Radium Treatment of Erythroplasia Penis. J. Körbler.—p. 61.
Effect of Roentgen Rays on Cell. P. del Buono.—p. 83.
Connection Between Sarcoma and Leukemia. W. Rathscheck.—p. 139.

Finsen Light Therapy in Lupus Vulgaris.—Lomholt reviews the evolution, construction and operation of Finsen apparatus for lupus vulgaris and the successful results achieved either by local irradiation or by supplementary light baths of the body. Of 187 patients, 175 (96.7 per cent) were cured. Reexamination, after a period of years, of 350 patients, representing a section of the country whose past history was one of serious and neglected cases, showed 76.5 per cent healed and 16 per cent with smaller and 7.5 per cent with larger infectious traces. Two thirds of all patients were women. The therapy consists of from four to six series of treatments (direct current, 40 ampere lamp intensity) lasting from twenty to thirty minutes each and extending from two to three weeks and leaves soft, smooth scars with a minimum of disfigurement. Patients report for periodic reexaminations. The author points out that a parallelism was found statistically between the incidence of pulmonary tuberculosis and lupus vulgaris in different districts of the country. A bacteriologic test showed the presence of bovine tuberculosis in 45 per cent of 110 cases in which reaction was obtained, though lupus, contrary to the general belief, is not predominantly a rural disease and is found in countries, such as Norway and Finland, in which bovine tuberculosis is practically unknown.

Klinicheskaya Meditsina, Moscow

18:1-208 (No. 1) 1940. **Partial Index**

Symptomatology of Brucellosis. A. L. Myasnikov.—p. 24.
*Etiologic Factors in Atherosclerosis of 134 Cases. D. M. Grotel, E. E. Bykhovskaya, M. M. Pavlova, M. G. Pokhodilova and V. G. Shor. —p. 34.
Age Alterations of Lipoid Metabolism. V. I. Solutsev.—p. 50.
Blood Lipids in Normal Persons and in Persons with Atherosclerosis. B. V. Ilyinskiy.—p. 55.
Residual Blood Carbonates in Cardiovascular Disease with Decompensation. D. G. Krichin.—p. 90.
Blood Iodine in Normal Persons and in Exophthalmic Goiter. N. M. Vaysman.—p. 97.

Atherosclerosis.—Grotel and his co-workers studied 485 patients with a clinical diagnosis of atherosclerosis and 105 control patients. In 134 cases of the group presenting atherosclerosis a postmortem examination was made. In the present study only the cases with a postmortem (134) are included. Histories and microscopic studies were carried out according to a definite scheme. An attempt was made to correlate the two. The effect of alcohol, nicotine, psychic factors and iffection was investigated. Microscopic studies failed to establish any important role of alcohol in the development of atherosclerosis. Attention is called to the frequent occurrence of atherosclerosis among Mohammedan peoples, almost none of whom use alcoholic drinks. A study of thirty heavy smokers and twenty persons who did not smoke demonstrated the existence of a definite parallelism between smoking and the degree of atherosclerosis, especially with regard to the coronary arteries. There were three times as many smokers with coronary atherosclerosis as nonsmokers (75 per cent and 25 per cent). Likewise among patients exhibiting a more severe degree of atherosclerosis of the brain vessels there were 65.5 per cent of smokers and 34.5 per cent of nonsmokers. With regard to the influence of the psychic sphere, the authors found that among patients exhibiting a high degree of aortic sclerosis 40 per cent had a history of psychic trauma as compared with 30 per cent who did not have such a history. Intensive work as a factor in definite aortic sclerosis was noted one and one half times more frequently than in a group with a mild degree of atherosclerosis. Psychic trauma was absent in 32.5 per cent of cases of mild degrees of coronary atherosclerosis, whereas psychic trauma was absent in only 17.3 per cent with marked coronary atherosclerosis. As the degree of coronary atherosclerosis increased, so did the incidence of psychic trauma. The shocking or sudden psychic trauma and intensive intellectual labor were found predominantly in the group with grave coronary atherosclerosis, whereas chronic protracted trauma was more frequent in the group of atherosclerosis of brain vessels. Infectious diseases did not seem to influence the incidence of atherosclerotic changes. A slight predominance existed only in the case of rheumatic infection and pneumonia. With regard to the role of nutrition, the material was divided into three groups: (1) the group with normal nutrition, (2) the group with prolonged, excessive nutrition, particularly with regard to animal proteins and cholesterol-containing substances and (3) the group with a history of prolonged periods of insufficient food intake, particularly of animal proteins and cholesterol-containing substances. In a group exhibiting a mild degree of atherosclerosis, the greatest incidence belonged to the group with insufficient nutrition. As the degree of atherosclerosis increased, the predominance was taken by the group with normal or excessive nutrition. The same relation was noted with regard to coronary atherosclerosis. The greater the degree of coronary involvement, the less is the percentage of patients with insufficient nourishment and the greater the percentage with normal or excessive nourishment. The authors emphasize the dependence of the degree of atherosclerosis of the aorta and of the coronary vessels on excessive use of cholesterol-containing substances. The following conclusions were drawn: 1. Chronic alcoholic intoxication apparently has a secondary role in the etiology of atherosclerosis. 2. A chronic nicotine intoxication assists in the development of atherosclerosis in general and of coronary atherosclerosis in particular. 3. The significance of excessive nourishment and particularly of excessive intake of animal proteins and cholesterol-containing foods is definite. 4. Psychic trauma plays an important part in the development of coronary atherosclerosis. This is true of sudden psychic trauma as well as of long continued overwork on the part of the psychic sphere (intensive intellectual labor). 5. The role of infections in the etiology and pathogenesis of atherosclerosis has not been demonstrated.

Vrachebnoe Delo, Kharkov

21:611-690 (Nos. 10-11) 1939. **Partial Index**

Male Climacteric. A. M. Sigal.—p. 617.
*Combined Dietetic, Ammonium Chloride and Digitalis Therapy of Cardiovascular Decompensation. A. I. Gruzin.—p. 625.
Etiology of Pneumonia in Childhood. S. V. Rodkin, E. M. Turchina, K. G. Breslavskiy and O. S. Kotservalova.—p. 629.
Pathogenesis of Pneumonia Complicating Measles: Allergic Vasculitis. P. P. Ochkur.—p. 633.
Microscopic Studies of Ulcers of Colon in Children. N. A. Maksimovich. —p. 637.

Dietetic, Ammonium Chloride and Digitalis Therapy of Cardiac Decompensation.—According to Gruzin the effect of rapid dehydration of a dropsical patient by means of powerful diuretics such as merbaphen, salyrgan and mercurosal is not always a favorable one. Rapid dehydration weakens the organism. The effect of mercurial preparations on the kidneys is not a harmless one and the excellent diuretic effect is almost always transient and is not infrequently followed by an increase in the edematous state. The author proposed in 1936 a combined therapeutic method which can be modified, depending on the needs in the individual case. The essence of the treatment consists in giving a cardiac patient in a state of decompensation

a calorically adequate diuretic diet and ammonium chloride for four days. The diet consists of milk, whey, baked apples, cream, sugar, butter, baked potatoes, and dextrose intravenously. The albumin content of the twenty-four hour ration amounts to 84 Gm., of fats to 41 Gm. and of carbohydrates to 191 Gm. The caloric value amounts to 1,515. Most of the ingredients in this diet possess a diuretic effect. This ration is divided into five or six portions. Addition of ammonium chloride increased diuresis. Ammonium chloride was found not to be injurious to the kidneys, even in the presence of a chronic nephritis. Studies of the alkali reserve of the blood after protracted administration of ammonium chloride demonstrated an increase in the alkali reserve of the blood and a lowered ammonia in the urine. The author's experience with over 1,000 patients suggests the superiority of the gradual method of dehydration by means of his combined method over the administration of mercurials. In cases accompanied by tachycardia and arrhythmia the author added to the foregoing 0.1 Gm. of digitalis three times daily.

Acta Chirurgica Scandinavica, Stockholm

88:479-570 (March 10) 1940

*Some Investigations into Occurrence of Carcinoma of Breast with Special Reference to Ovarian Function. B. Heiberg and P. Heiberg.—p. 479.
Incarcerated Femoral Hernia with Simultaneous Incarceration of Appendix. H. B. Wulff.—p. 497.
Effects of Arterial Resection: Experimental Angiographic Study. J. P. Strömbeck.—p. 510.
Diaphragmatic Hernia. E. Bergenfeldt.—p. 519.
*Experimental Study of Role of Bone Marrow in Bone Regeneration. G. Levander.—p. 545.
Melorheostosis s. Osteosis Eburnisans Monomelica. A. Bertelsen.—p. 561.

Carcinoma of Breast and Ovarian Function.—According to the Heibergs there is disagreement about the nature of the relationship between the ovarian function and the development of carcinoma of the breast. They cite statistics on the incidence of mammary carcinoma in married and unmarried women, among others an investigation into the mortality from mammary carcinoma undertaken by the League of Nations in 1926. This report indicated that the death rate was higher in unmarried than in married women. Herrel demonstrated in 1937 that double oophorectomy exerts a protective influence against mammary carcinoma. In the same year Olck showed that the menopause occurs later in patients with mammary carcinoma than in other women. These three different clinical factors, high incidence in unmarried women and in those with a late menopause and the seemingly protective influence of castration, suggest that mammary cancer occurs most frequently in those in whom the menstrual cycles have been most frequent. The authors' inquiry into the proportion of unmarried to married women among those who died from mammary carcinoma in Denmark during the years 1931-1937 likewise indicates a higher mortality among unmarried than among married women. Clinical notes on 1,200 cases of mammary carcinoma from different hospitals in Copenhagen revealed a greater number of unmarried than of married women, compared with the relative proportions in the corresponding age groups of the general population. The menopause was found to occur later in women with mammary carcinoma, but it was not possible to establish a connection between previous gynecologic or endocrine disease and the development of carcinoma of the breast. The authors consider it possible that the predominance of mammary cancer in unmarried women may be due to the more frequent development of one particular type of carcinoma. They hope that microscopic studies will help in differentiating this and other types of carcinomas.

Bone Marrow in Regeneration of Bone.—Levander calls attention to a disagreement as to the role assumed by the bone marrow in the production of callus. He carried out two series of experiments in rabbits with grafting of bone marrow into soft tissues. All grafting was autoplastic and made into the subcutaneous tissue. Twelve full grown rabbits were used in the first series of experiments. The period of observation varied from fourteen to fifty-eight days. In five cases bone formation was obtained. In the second series, carried out with the view of studying the histogenesis of the regenerated bone, young animals were used, the period of observation being from two to eleven days. Morphologic analysis of the tissue reactions in this series showed that the grafted bone marrow cells had died. The new bone apparently arises from the mesenchymal tissue formed around the graft. It is the author's opinion that there are no preexisting osteoblasts in the bone marrow. Instead, the bone marrow stimulates bone formation through some inherent substance possessing the power of influencing the nonspecific mesenchymal tissue to form bone.

Nordisk Medicin, Gothenburg

5:269-318 (Feb. 17) 1940. Partial Index

Norsk Magasin for Lægevidenskapen

Pellagra and Pellagrous Cutaneous Changes After Treatment with Vitamin B_1 and Vitamin C. O. Salvesen.—p. 279.
*Benign Gastric Tumors. H. Myhre.—p. 282.
Ovarian Hemorrhages. K. Harstad.—p. 286.
Problems in Treatment of Varices. S. Winge.—p. 289.
Pathogenicity of Endamoeba Histolytica: Preliminary Report. J. Bøe.—p. 292.
Establishment of Tumor Cells in Sternal Punctate. E. Poppe and L. Kreyberg.—p. 294.
Kala-Azar (Visceral Leishmaniasis). A. H. Brinchmann.—p. 297.

Benign Gastric Tumors.—According to Myhre, benign gastric tumors, which he classifies as epithelial and not epithelial, are relatively frequent. The epithelial tumors (adenomas and adenopapillomas) occur far more often than the not epithelial (myomas and numerous other forms). A few cases of aberrant pancreatic remnants in the stomach wall have been reported and are classified as not epithelial tumors. The epithelial tumors may be solitary or few. In some cases they line the stomach wall. Most of them enter under the concept of a polyp, where a number of the not epithelial forms also belong because of their macroscopic appearance. The polyp form is ascribed to the action of peristalsis on the tumor. Epithelial tumors are often accompanied by gastritis and anacidity and not infrequently undergo malignant degeneration. Other important symptoms of benign gastric tumors are hemorrhages, constriction and invagination of the stomach. Many cases are latent or partly so and are accidental discoveries at necropsy. Diagnosis must depend on x-ray examination, made with especially careful technic, and on gastroscopy. Some of the small tumors, also larger angiomas, when very soft, can be established only by gastroscopy. Four cases are described in which gastroscopy was done.

5:319-370 (Feb. 24) 1940

*Functional Aortic Insufficiency. H. A. Salvesen.—p. 320.

Functional Aortic Insufficiency.—Salvesen believes that functional aortic insufficiency in hypertonic nephritis is far more frequent than was formerly supposed. There was a diastolic regurgitation murmur over the heart, usually over the apex or near it, in twelve (18.75 per cent) of the sixty-four fatal cases of azotemic uremia treated from 1925 to 1939. The valves were normal, and, while there was marked hypertrophy of the heart, no distention of the aorta or of the ostium aorta was demonstrable, and a relative insufficiency due to distension seems improbable. There were no peripheral manifestations of aortic insufficiency. A certain physiologic insufficiency is assumed to exist. The regurgitation murmur is interpreted as a functional insufficiency (pathologic increase of the physiologic insufficiency) dependent on the high pressure (pressure insufficiency).

Hospitalstidende

Use of Cobra Toxin in Treatment of Neuralgias and Neurosyphilis. O. J. Nielsen.—p. 325.
Disinfection of Books. L. E. Walbum.—p. 328.
*Sternal Punctate in Idiopathic Thrombopenic Purpura (Morbus Maculosus Werlhofi). C. Holten and I. Munkholm.—p. 332.

Sternal Punctate in Idiopathic Thrombopenic Purpura.—Holten and Munkholm examined the bone marrow of seven patients with idiopathic thrombopenic purpura, in two cases half a year and four years respectively after splenectomy, in one case shortly before and shortly after splenectomy and in four cases before splenectomy. No difference in the sternal punctate of the patients operated on and those not operated on could be demonstrated, and there were on the whole no deviations from the normal which could not be explained as lively regeneration due to the bleeding. No certain changes in the megakaryocytes were established.